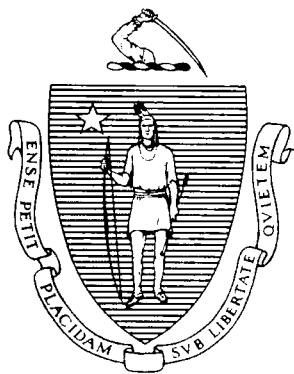


**Commonwealth of Massachusetts**

**Division of Public Employee  
Retirement Administration**



**INVESTMENT REPORT  
MASSACHUSETTS CONTRIBUTORY RETIREMENT  
SYSTEMS FOR PUBLIC EMPLOYEES**

**DECEMBER 31, 1990**

**WILLIAM F. WELD**  
Governor

**PETER NESSEN**  
Secretary of Administration  
and Finance

**JOHN J. McGLYNN**  
Commissioner  
Public Employee Retirement Administration

August 20, 1991

We are pleased to present the sixth annual report on the investment activities of the Massachusetts Contributory Retirement Systems. PERA during this period has, for the first time in the history of the Commonwealth, provided an objective review of investment performance as well as an analysis of asset growth, transaction costs, allocation strategy, and other aspects of investment of retirement system assets.

Massachusetts public pension assets have now grown to \$12,018,151,851. These monies, which for the most part represent employee contributions, will ultimately be used to provide benefits to retirees and their beneficiaries. The average annual rate of return for the 106 systems reviewed during the six-year period has been 10.97%. This rate of return is 2.97% above the anticipated return of 8% and if maintained will lead to savings for the state and its cities and towns through lower than anticipated appropriations to pay benefits.

Since 1985, the investment of public pension funds in Massachusetts has changed dramatically. Retirement Boards have aggressively pursued new strategies made available to them due to statutory reforms. This movement towards professional money management protected system assets in the turbulent markets of 1987 and 1990. In 1990 systems, in general, avoided dramatic losses in a very difficult market environment.

PERA's efforts in the investment area go far beyond this investment report. This Division has actively assisted Boards in recouping in excess of \$1.5 million owed to them by brokers, money managers and other parties. Regulations governing Boards' investment activity have been promulgated, 103 waivers authorizing the professional management of assets have been issued, educational programs offered and periodic investment audits of the systems conducted.

PERA is grateful for the cooperation of Retirement Board members and staff who have made possible the production of these reports which provide important information to policy-makers, retirees, employees and the general public.

In these difficult financial times, the successful investment of pension monies has been a bright spot for the state and many of its communities. PERA will continue its efforts to assist Boards in assuring that pension assets are invested safely and successfully.

Sincerely,



JOHN J. McGLYNN  
Commissioner

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**PART I:**

**ANNUAL REPORT OF THE MASSACHUSETTS CONTRIBUTORY  
RETIREMENT SYSTEMS FOR THE YEAR ENDING DECEMBER 31, 1990**

Public employees in Massachusetts are members of 106 retirement systems at the state, city, county and municipal levels. Each system is administered by a three member board consisting of an ex-officio member, a member elected by employees and retirees and a member jointly chosen by the ex-officio and elected members. The Board's responsibilities include awarding benefits, managing cash flows and the investment of assets. The subject of this report is the Retirement Boards' activity in the investment area.

The Division of Public Employee Retirement Administration (PERA) is statutorily directed to oversee the retirement systems. In the investment area, PERA has specific responsibilities in allowing assets to be invested in a more flexible manner, in measuring performance and in conducting audits to assure that assets are invested properly.

Retirement Boards have three investment options under Massachusetts law:

- (1) Assets may be invested according to the statutory "Legal List";
- (2) Investment authority may be delegated to professional money managers who may invest according to the prudent person standard; or
- (3) Assets may be transferred to the Pension Reserve Investment Trust Fund and invested by a Board according to the prudent person standard.

One goal of pension fund investing is an increase in assets to help defray the cost of benefits. This goal is more relevant to the Massachusetts pension plans due to the unfunded liabilities which exist in the systems. These liabilities, which are a result of the "pay as you go" financing mechanism used to pay retirement benefits, are substantial and represent a tremendous drain on public resources. Asset growth due to increased investment return can help relieve the pressure the unfunded liabilities place on state and local budgets.

In reviewing investment performance, PERA has established rates of return for one-year, three-years, five-years and January 1, 1985 - December 31, 1990. The information contained in this study will enable Board members to make knowledgeable decisions in this area and will provide employees, public officials and taxpayers with insight to the investment of public pension monies.

Investment return has a critical impact on costs. This is underscored by the actuarial valuation of each system which assesses the value of assets and liabilities. Achievement of the expected rate of return is a minimum in maintaining the ratio between assets and liabilities. A return in excess of the expected return will improve the system's funded status.

The expected rate of return used in the most recent actuarial report of the Massachusetts systems is 8%. In 1990, the average rate of return was 1.65%, from 1988-1990, the average rate of return was 9.44%, from 1986-1990, the average rate of return was 8.83% and from 1985-1990, the average rate of return was 10.97%. In spite of poor market conditions in 1987 and 1990, the Massachusetts public pension systems have performed well during the past six years. (See Figures 1 and 2.)

Annual Returns ( % )

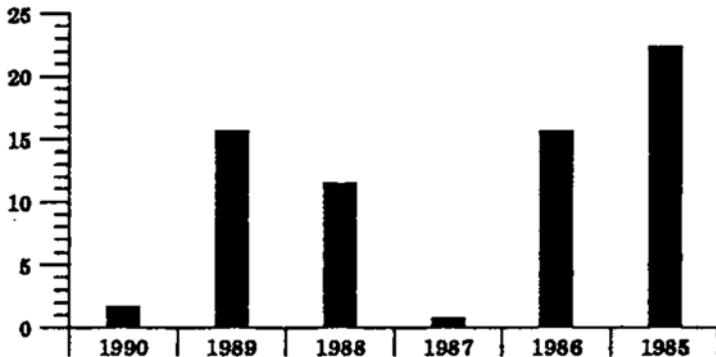


Figure 1

Average Returns ( % )

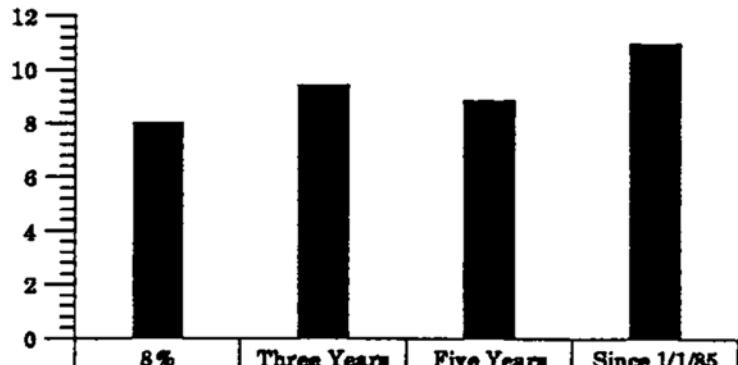


Figure 2

Massachusetts statute establishes the fiduciary obligation of each Retirement Board member. That standard is similar to the ERISA requirements applicable to private pension plans. The Board must discharge its duties for the exclusive purpose of providing benefits to system members and their beneficiaries, with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims and by diversifying the investments of the system so as to minimize the risk of large losses unless under the circumstances it is clearly prudent not to do so.

Thus, in addition to other statutory limits, the investment of pension funds by Board members must take place in accordance with fiduciary duty. Failure to comply with that duty could subject individual Board members to personal liability.

In 1990, returns were driven by a contradictory market signal, a positive bond market and a negative stock market. The return of individual systems in general was determined by the level of assets committed to stocks and bonds. Those with significant bond portfolios outperformed those where the amounts dedicated to equities were greater than the amounts dedicated to fixed income investments. It should be noted

that the 1990 phenomena of the bond market outperforming the stock market runs counter to long term trends. Historically, stocks have outperformed bonds. In fact, a review of the retirement systems' performance for the 1985-1990 period indicates that, over longer periods, those systems with assets dedicated to equities outperformed those which emphasized fixed income investments. (See Figures 3 and 4.)

**S & P 500 Index**

1985	31.57%
1986	18.57%
1987	5.09%
1988	16.61%
1989	31.69%
1990	-3.11%
<b>Past Three Years</b>	<b>14.10%</b>
<b>Past Five Years</b>	<b>13.14%</b>
<b>Since January 1985</b>	<b>16.02%</b>

Figure 3

**Shearson Lehman Govt/Corp Bond Index**

1985	21.33%
1986	15.59%
1987	2.31%
1988	7.59%
1989	14.23%
1990	8.29%
<b>Past Three Years</b>	<b>10.00%</b>
<b>Past Five Years</b>	<b>9.50%</b>
<b>Since January 1985</b>	<b>11.38%</b>

Figure 4

PERA employs the generally recognized methodology of the Bank Administration Institute in computing returns. Investments are valued at market and interest and dividends accrued each quarter. The rate of return calculation combines market value changes with interest and dividends accrued. Those returns are time-weighted not dollar-weighted.

Prior to the finalization of performance figures, retirement boards are provided with an opportunity to review PERA records on which the result is based. Individual retirement systems participating in the PRIT Fund may have their returns increased by state assistance. Any such assistance does not increase the return of the PRIT Fund itself.

PERA would like to thank the Retirement Board members and staff, investment managers, consultants and custodians for their cooperation without which this study could not have been conducted.

Continued analysis of the investment practices of the Retirement Boards will improve investment results and directly benefit employees, retirees and taxpayers.

*Annual Report of the*  
**Massachusetts Contributory Retirement Systems**  
*for the year ending December 31, 1990*

Table One

**Annual Returns**

Page One

<b>Retirement System</b>	<b>Annual Returns</b>											
	1990		1989		1988		1987		1986		1985	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
EASTHAMPTON	8.20	1	16.51	40	12.83	21	1.99	42	14.07	46	20.94	60
ATHOL	7.91	2	14.09	66	9.00	79	3.72	20	9.82	94	19.90	71
FALMOUTH	7.09	3	21.10	1	9.76	66	2.30	38	12.41	70	18.37	88
PLYMOUTH	6.89	4	16.18	46	8.33	85	-2.04	88	15.73	30	28.32	5
MASS TURNPIKE AUT	6.88	5	14.03	69	10.78	45	3.15	27	16.90	13	22.68	42
NORWOOD	6.60	6	17.01	23	11.22	38	2.83	32	13.30	55	17.17	95
FALL RIVER	6.14	7	18.03	15	6.41	105	1.94	43	15.35	33	25.14	20
BRISTOL COUNTY	6.01	8	15.18	57	7.70	97	-1.20	82	11.43	79	21.05	59
GREENFIELD	5.92	9	15.28	56	8.34	84	0.30	66	13.19	58	17.23	93
DANVERS	5.79	10	14.05	68	10.57	52	1.70	49	9.84	92	19.13	84
MILFORD	5.77	11	16.95	26	8.05	91	-4.86	102	8.98	103	19.66	76
SPRINGFIELD	5.76	12	19.93	6	8.54	83	-1.18	80	14.91	38	20.45	63
CHELSEA	5.70	13	14.75	60	9.43	74	-1.82	86	13.48	52	24.06	24
WOBURN	5.62	14	13.06	87	8.56	82	-0.50	75	21.69	2	32.44	1
FRANKLIN COUNTY	5.61	15	11.95	90	9.51	73	-0.24	71	7.73	105	18.34	89
EVERETT	5.57	16	20.01	5	6.85	103	0.98	58	13.56	49	22.43	45
WINCHESTER	5.51	17	15.75	52	9.62	67	0.01	68	15.27	35	22.77	37
TAUNTON	5.49	18	16.83	34	10.64	48	6.06	2	20.07	5	23.41	33
ADAMS	5.37	19	11.52	93	6.58	104	5.35	3	9.14	102	26.30	14
ATTLEBORO	5.27	20	19.11	10	6.92	102	2.48	34	12.91	63	19.87	73
FITCHBURG	5.24	21	17.14	21	10.40	55	1.32	54	12.41	71	15.35	99
AMESBURY	5.21	22	14.00	70	10.95	40	0.23	67	10.19	89	18.62	85
LEOMINSTER	5.19	23	13.93	71	10.03	61	2.47	35	12.21	74	19.64	77
WESTFIELD	5.11	24	16.86	31	8.11	90	0.77	63	15.59	32	20.29	65
BERKSHIRE COUNTY	5.08	25	10.49	96	9.17	77	1.83	46	13.25	57	21.92	52
MEDFORD	5.07	26	14.70	61	10.00	62	1.41	51	15.12	37	20.35	64
NEWBURYPORT	5.07	27	13.61	73	10.32	57	-1.62	84	9.18	100	20.08	69

Table One

Annual Returns

Page Two

<u>Retirement System</u>	1990		1989		1988		1987		1986		1985	
	<u>Return</u>	<u>Rank</u>										
FRAMINGHAM	4.94	28	13.53	74	9.55	70	2.63	33	13.56	50	19.37	81
HAMPSHIRE COUNTY	4.88	29	14.16	65	8.25	86	4.40	12	11.73	77	17.17	94
PITTSFIELD	4.79	30	15.12	59	9.54	71	-1.81	85	13.05	60	24.07	23
ESSEX COUNTY	4.56	31	13.07	85	11.87	32	-1.19	81	17.16	12	25.17	19
CONCORD	4.48	32	17.24	19	10.48	53	3.68	21	10.67	86	16.77	96
WALTHAM	4.46	33	20.97	2	7.18	100	1.40	52	16.65	17	22.20	49
CHICOPEE	4.39	34	13.10	83	12.42	27	-0.18	70	10.53	87	20.23	66
MASS PORT AUTH	4.32	35	19.14	9	11.34	36	3.93	17	18.68	9	22.18	50
WEST SPRINGFIELD	4.30	36	16.51	41	10.63	49	1.07	57	11.20	81	15.79	98
MARLBOROUGH	4.21	37	14.08	67	14.11	2	-0.71	77	9.91	90	21.89	54
QUINCY	4.09	38	13.43	78	6.36	106	-4.66	101	13.30	56	18.62	86
PLYMOUTH COUNTY	4.08	39	12.83	89	10.46	54	-1.30	83	16.71	15	24.66	21
GLOUCESTER	3.89	40	13.23	80	13.68	7	-0.45	74	16.57	19	25.69	16
BLUE HILLS REG VO	3.83	41	15.39	55	9.51	72	3.09	29	13.35	54	11.67	104
GREATER LAWRENCE	3.80	42	11.36	94	8.13	88	1.71	48	7.28	106	7.69	106
WORCESTER COUNTY	3.72	43	10.30	97	8.59	81	1.40	53	16.05	26	27.06	11
REVERE	3.71	44	8.79	102	9.26	76	2.40	36	9.66	96	14.44	101
SOUTHBRIDGE	3.55	45	6.77	105	7.82	94	-2.85	92	16.06	25	23.91	26
HOLYoke	3.50	46	13.13	82	12.85	20	4.23	13	14.15	45	27.88	9
NATICK	3.47	47	17.21	20	10.91	42	-0.09	69	14.56	42	25.80	15
STONEHAM	3.41	48	16.13	47	8.63	80	2.37	37	16.38	22	23.69	30
WINTHROP	3.41	49	16.58	38	10.05	60	-0.24	72	14.67	40	18.51	87
SALEM	3.31	50	12.86	88	7.39	98	2.99	30	14.57	41	19.46	79
HULL	3.23	51	9.39	100	9.79	65	0.57	64	11.36	80	17.28	91
LAWRENCE	3.22	52	19.04	11	5.44	107	-2.18	89	12.24	72	23.67	31
MELROSE	3.12	53	16.27	45	10.35	56	2.11	39	16.48	20	21.15	58
ARLINGTON	3.11	54	15.81	51	10.23	58	3.11	28	16.64	18	20.13	68

Table One

## Annual Returns

Page Three

<b>Retirement System</b>	<b>1990</b>		<b>1989</b>		<b>1988</b>		<b>1987</b>		<b>1986</b>		<b>1985</b>	
	<b>Return</b>	<b>Rank</b>										
NORTH ATTLEBORO	3.07	55	15.93	50	9.60	68	0.57	65	12.66	66	17.64	90
PEABODY	3.01	56	13.43	77	12.77	22	-0.41	73	15.77	29	23.23	34
BRAINTREE	2.68	57	13.84	72	10.59	51	5.18	4	16.41	21	22.88	36
WELLESLEY	2.66	58	17.64	17	12.46	26	3.23	25	17.91	10	22.73	39
METHUEN	2.43	59	13.21	81	8.16	87	1.87	45	13.51	51	20.03	70
SWAMPSCOTT	2.37	60	18.93	13	14.25	1	-3.90	99	10.87	83	27.94	7
NORTH ADAMS	2.31	61	19.79	7	9.31	75	-2.33	90	9.84	93	23.80	28
HAMPDEN COUNTY	2.24	62	15.12	58	11.37	35	2.03	41	13.89	47	20.78	61
NORTHAMPTON	2.24	63	18.12	14	11.28	37	-6.82	106	12.44	69	22.07	51
LEXINGTON	2.05	64	13.48	75	9.57	69	-0.91	79	15.67	31	25.47	18
STATE TEACHERS	1.95	65	15.64	54	12.54	25	0.96	59	16.03	27	24.01	25
MIDDLESEX COUNTY	1.83	66	16.33	44	11.16	39	2.06	40	14.89	39	22.92	35
BEVERLY	1.65	67	10.28	98	10.64	47	-0.71	76	12.97	61	20.71	62
WORCESTER	1.56	68	14.39	64	12.22	29	1.78	47	15.81	28	19.25	83
BROOKLINE	1.54	69	19.78	8	9.81	64	0.95	61	11.78	76	16.24	97
LOWELL	1.39	70	11.92	91	7.32	99	3.74	19	14.50	43	20.21	67
HAVERHILL	1.30	71	13.43	76	13.40	16	2.87	31	16.80	14	22.71	40
SOMERVILLE	0.94	72	13.07	86	10.79	44	-7.08	107	13.14	59	29.94	3
MARBLEHEAD	0.81	73	18.96	12	10.61	50	-3.24	96	7.88	104	21.90	53
STATE	0.44	74	15.70	53	12.67	24	1.89	44	16.17	23	24.10	22
BELMONT	0.41	75	17.03	22	10.95	41	-2.90	94	9.59	97	23.88	27
MALDEN	0.21	76	20.33	4	11.98	31	-2.94	95	9.38	99	22.27	48
WATERTOWN	0.21	77	13.10	84	12.25	28	1.29	55	12.23	73	19.89	72
LYNN	0.12	78	17.50	18	11.62	34	-1.95	87	12.20	75	23.66	32
CAMBRIDGE	0.02	79	10.95	95	7.91	93	-2.86	93	16.69	16	31.96	2
ANDOVER	-0.12	80	13.26	79	10.18	59	0.95	60	15.15	36	26.79	13
CLINTON	-0.18	81	7.65	104	7.81	95	-5.31	103	12.45	68	28.89	4

Table One

## Annual Returns

Page Four

<u>Retirement System</u>	1990		1989		1988		1987		1986		1985	
	<u>Return</u>	<u>Rank</u>										
BROCKTON	-0.91	82	11.62	92	8.12	89	1.63	50	12.47	67	22.38	46
WEBSTER	-0.92	83	5.43	107	7.10	101	3.36	23	13.46	53	19.71	75
MASS WATER RESOUR	-1.02	84	14.60	63	10.66	46	6.32	1	5.78	107	N/A	N/A
NORFOLK COUNTY	-1.16	85	16.62	36	13.42	14	4.14	15	17.47	11	23.77	29
GARDNER	-1.22	86	16.97	25	13.41	15	3.16	26	12.94	62	19.45	80
BARNSTABLE COUNTY	-1.32	87	9.15	101	9.14	78	-5.48	104	12.69	64	21.15	57
HINGHAM	-1.32	88	14.69	62	10.89	43	0.95	62	15.32	34	22.28	47
SAUGUS	-1.32	89	16.55	39	13.50	11	3.98	16	11.50	78	14.53	100
MONTAGUE	-1.34	90	16.39	43	13.56	9	4.86	5	9.15	101	13.28	102
FAIRHAVEN	-1.44	91	16.59	37	13.29	19	4.19	14	9.68	95	21.53	55
WAKEFIELD	-1.48	92	16.04	48	13.34	17	4.43	10	21.13	3	19.76	74
WEYMOUTH	-1.49	93	16.69	35	13.33	18	4.53	7	20.02	6	28.19	6
NORTHBRIDGE	-1.51	94	16.99	24	13.50	10	3.78	18	10.34	88	19.33	82
MINUTEMAN REG VO	-1.55	95	16.90	28	13.87	3	4.49	8	22.05	1	13.17	103
NEEDHAM	-1.55	96	16.84	33	13.83	4	4.67	6	20.76	4	19.58	78
MILTON	-1.59	97	16.88	29	13.49	12	4.46	9	10.93	82	22.53	43
DUKES COUNTY	-1.61	98	8.31	103	12.01	30	-4.55	100	10.68	85	22.68	41
DEDHAM	-1.64	99	16.43	42	9.98	63	3.61	22	12.67	65	27.93	8
MASS HOUSING FINA	-1.67	100	16.84	32	13.80	6	-0.90	78	9.39	98	9.58	105
READING	-1.67	101	16.91	27	11.71	33	-2.77	91	10.73	84	26.85	12
SHREWSBURY	-1.68	102	16.87	30	13.81	5	4.42	11	19.33	8	17.28	92
PRIM BOARD	-2.27	103	17.90	16	13.43	13	3.25	24	19.94	7	22.76	38
BOSTON	-2.82	104	20.36	3	12.73	23	-3.78	97	16.12	24	25.65	17
MAYNARD	-3.33	105	5.94	106	7.72	96	1.10	56	9.91	91	27.80	10
NEW BEDFORD	-3.36	106	10.07	99	8.04	92	-6.31	105	13.68	48	21.48	56
NEWTON	-4.57	107	16.02	49	13.60	8	-3.83	98	14.33	44	22.46	44

*Annual Report of the*  
**Massachusetts Contributory Retirement Systems**  
*for the year ending December 31, 1990*

Table Two

Past Returns ( Annualized )

Page One

<u>Retirement System</u>	Five Years		Three Years		Since January 1985	
	<u>Return</u>	<u>Rank</u>	<u>Return</u>	<u>Rank</u>	<u>Return</u>	<u>Rank</u>
TAUNTON	11.67	1	10.89	7	13.55	1
MASS PORT AUTH	11.29	2	11.44	5	13.03	3
MINUTEMAN REG VO	10.82	3	9.43	53	11.21	33
EASTHAMPTON	10.60	4	12.46	2	12.26	7
NEEDHAM	10.60	5	9.40	55	12.05	10
WELLESLEY	10.58	6	10.74	9	12.52	5
WAKEFIELD	10.38	7	9.02	76	11.89	13
FALMOUTH	10.36	8	12.49	1	11.65	18
WEYMOUTH	10.32	9	9.21	70	13.12	2
SHREWSBURY	10.26	10	9.36	58	11.40	25
MASS TURNPIKE AUT	10.24	11	10.52	15	12.22	8
PRIM BOARD	10.11	12	9.33	61	12.12	9
NORWOOD	10.08	13	11.53	4	11.23	32
WALTHAM	9.88	14	10.64	11	11.85	14
NORFOLK COUNTY	9.85	15	9.34	60	12.05	11
ARLINGTON	9.62	16	9.59	47	11.31	27
BRAINTREE	9.62	17	8.94	78	11.72	17
MELROSE	9.49	18	9.78	37	11.35	26
HOLYOKE	9.47	19	9.73	41	12.34	6
WOBURN	9.44	20	9.04	73	12.97	4
FALL RIVER	9.41	21	10.06	28	11.89	12
HAVERHILL	9.38	22	9.22	69	11.49	23
SPRINGFIELD	9.35	23	11.25	6	11.13	34
STATE TEACHERS	9.22	24	9.88	33	11.55	20
STONEHAM	9.22	25	9.26	65	11.51	22
CONCORD	9.20	26	10.61	13	10.43	54
EVERETT	9.19	27	10.62	12	11.29	28

Table Two

## Past Returns ( Annualized )

Page Two

<u>Retirement System</u>	Five Years		Three Years		Since January 1985	
	<u>Return</u>	<u>Rank</u>	<u>Return</u>	<u>Rank</u>	<u>Return</u>	<u>Rank</u>
ATTLEBORO	9.18	28	10.27	21	10.89	40
GLOUCESTER	9.18	29	10.17	24	11.78	16
FITCHBURG	9.16	30	10.82	8	10.17	60
STATE	9.16	31	9.40	56	11.52	21
MEDFORD	9.13	32	9.85	36	10.92	37
WESTFIELD	9.12	33	9.91	30	10.90	39
MIDDLESEX COUNTY	9.08	34	9.61	45	11.27	29
WINCHESTER	9.07	35	10.21	23	11.24	31
NATICK	9.01	36	10.39	16	11.65	19
WORCESTER	8.97	37	9.24	68	10.62	48
BLUE HILLS REG VO	8.92	38	9.48	50	9.38	86
ESSEX COUNTY	8.89	39	9.77	38	11.45	24
ATHOL	8.86	40	10.30	20	10.62	47
GARDNER	8.83	41	9.43	52	10.53	50
PLYMOUTH	8.81	42	10.39	17	11.84	15
HAMPDEN COUNTY	8.78	43	9.44	51	10.69	44
FRAMINGHAM	8.75	44	9.28	64	10.45	53
PEABODY	8.72	45	9.63	44	11.02	36
WINTHROP	8.70	46	9.88	34	10.28	58
LEOMINSTER	8.68	47	9.66	42	10.43	55
SAUGUS	8.64	48	9.29	63	9.60	82
MILTON	8.63	49	9.29	62	10.83	42
HAMPSHIRE COUNTY	8.62	50	9.03	74	10.00	67
WEST SPRINGFIELD	8.60	51	10.36	18	9.77	76
BROOKLINE	8.55	52	10.12	26	9.79	75
GREENFIELD	8.47	53	9.77	39	9.89	70
NORTHBRIDGE	8.41	54	9.36	57	10.16	62

Table Two

**Past Returns ( Annualized )**

Page Three

<b>Retirement System</b>	<b>Five Years</b>		<b>Three Years</b>		<b>Since January 1985</b>	
	<b>Return</b>	<b>Rank</b>	<b>Return</b>	<b>Rank</b>	<b>Return</b>	<b>Rank</b>
PLYMOUTH COUNTY	8.36	55	9.06	72	10.92	38
MONTAGUE	8.34	56	9.25	66	9.15	89
DANVERS	8.30	57	10.08	27	10.04	66
FAIRHAVEN	8.27	58	9.19	71	10.37	56
NORTH ATTLEBORO	8.21	59	9.41	54	9.73	77
SWAMPSCOTT	8.19	60	11.63	3	11.25	30
MARLBOROUGH	8.16	61	10.70	10	10.34	57
CHELSEA	8.14	62	9.90	31	10.64	46
SALEM	8.12	63	7.78	91	9.93	68
BOSTON	8.06	64	9.65	43	10.81	43
AMESBURY	8.01	65	9.99	29	9.71	78
DEDHAM	8.01	66	7.99	84	11.10	35
PITTSFIELD	7.96	67	9.74	40	10.50	51
CHICOPEE	7.93	68	9.90	32	9.89	69
BERKSHIRE COUNTY	7.89	69	8.22	82	10.11	64
WORCESTER COUNTY	7.89	70	7.50	94	10.87	41
HINGHAM	7.88	71	7.87	87	10.16	61
LEXINGTON	7.78	72	8.26	81	10.54	49
METHUEN	7.72	73	7.85	89	9.68	79
ANDOVER	7.70	74	7.62	93	10.67	45
BRISTOL COUNTY	7.68	75	9.56	48	9.80	74
LOWELL	7.66	76	6.79	98	9.66	80
WATERTOWN	7.66	77	8.36	80	9.61	81
LYNN	7.63	78	9.50	49	10.15	63
ADAMS	7.57	79	7.79	90	10.48	52
NORTH ADAMS	7.53	80	10.24	22	10.08	65
MALDEN	7.47	81	10.53	14	9.81	73

Table Two

**Past Returns ( Annualized )****Page Four**

<b>Retirement System</b>	<b>Five Years</b>		<b>Three Years</b>		<b>Since January 1985</b>	
	<b>Return</b>	<b>Rank</b>	<b>Return</b>	<b>Rank</b>	<b>Return</b>	<b>Rank</b>
LAWRENCE	7.30	82	9.02	75	9.87	71
MASS HOUSING FINA	7.22	83	9.34	59	7.61	102
NEWBURYPORT	7.18	84	9.61	46	9.23	87
MASS WATER RESOUR.	7.14	85	7.87	88	N/A	N/A
NORTHAMPTON	7.08	86	10.35	19	9.45	85
BEVERLY	6.83	87	7.44	95	9.02	91
FRANKLIN COUNTY	6.83	88	8.99	77	8.67	95
HULL	6.78	89	7.43	96	8.47	96
BELMONT	6.77	90	9.24	67	9.45	84
MILFORD	6.74	91	10.15	25	8.79	94
MARBLEHEAD	6.72	92	9.87	35	9.11	90
REVERE	6.72	93	7.22	97	7.97	99
NEWTON	6.70	94	7.94	85	9.18	88
READING	6.70	95	8.70	79	9.82	72
BROCKTON	6.45	96	6.14	100	8.95	92
GREATER LAWRENCE	6.40	97	7.72	92	6.61	106
CAMBRIDGE	6.30	98	6.19	99	10.20	59
QUINCY	6.29	99	7.89	86	8.25	97
SOUTHBRIDGE	6.09	100	6.03	102	8.87	93
SOMERVILLE	5.86	101	8.14	83	9.54	83
WEBSTER	5.58	102	3.81	106	7.81	100
DUKES COUNTY	4.75	103	6.08	101	7.54	103
BARNSTABLE COUNTY	4.60	104	5.54	103	7.19	104
CLINTON	4.29	105	5.03	104	8.04	98
MAYNARD	4.16	106	3.33	107	7.77	101
NEW BEDFORD	4.13	107	4.75	105	6.84	105

## **PART II:**

### **RETURNS BY ASSET CATEGORY AND ASSET ALLOCATION**

Pursuant to state law, guidelines have been established for the investment of public pension funds in Massachusetts. The guidelines limit the amount that can be dedicated to each major asset class, including equities, fixed income and real estate. The goal of these guidelines is to insure that investments are adequately diversified and that unnecessary risk is not assumed.

Most retirement systems must invest according to the following:

- (1) Equity investments may not exceed 40% of the book value of the overall portfolio;
- (2) A minimum of 40% and a maximum of 80% of the market value of the total portfolio must be allocated to fixed income investments with a maturity greater than one year; and
- (3) Cash and short term investments may not exceed 40% of the market value of the total portfolio.

Within each asset class, the following rules apply:

#### **Equity**

- (1) 75% of equity investments must be in the stock of companies with a minimum of \$100 million worth of outstanding shares;
- (2) No more than 5% of equity investments may be dedicated to the shares of one company;
- (3) Equities must be traded on a U.S. Exchange or over the counter;
- (4) Equity turnover may not exceed 50% of the average equity market value per year;
- (5) Real estate investments are limited to 5% of the overall portfolio; and
- (6) Venture capital investments may not exceed 5% of the overall portfolio.

#### **Fixed Income**

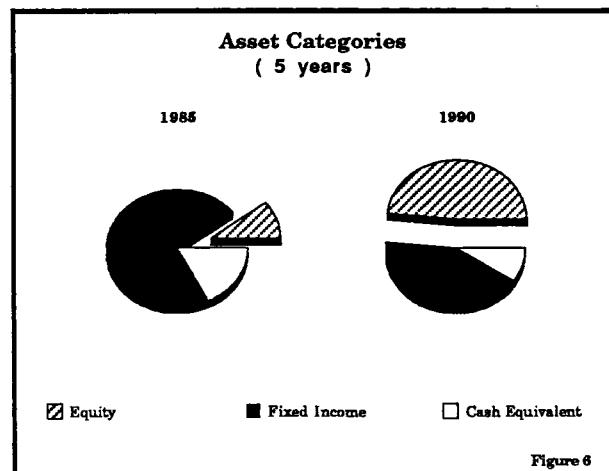
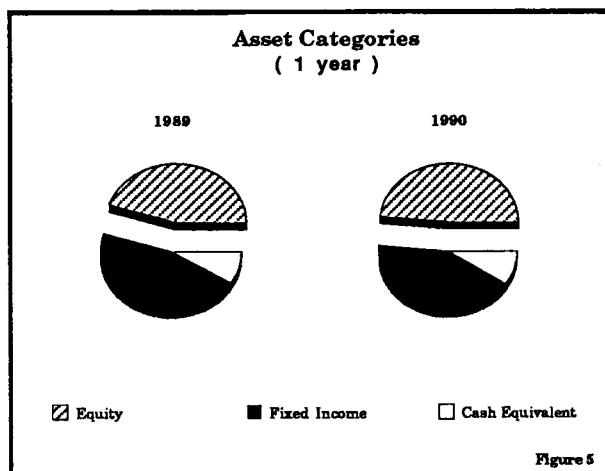
- (1) Fixed income investments must be rated BAA or better;
- (2) 75% of the par value of fixed income investments must be rated A or better;
- (3) No more than 5% of fixed income investments may be dedicated to the obligations of any one company;
- (4) Eligible issues must have \$50 million in outstanding par at the time of purchase; and
- (5) Fixed income turnover is limited to 100% per year.

PERA is authorized to approve supplementary regulations which may adjust the regulatory guidelines. Boards must make an application for such a supplementary regulation. Massachusetts law prohibits the investments of retirement funds in companies doing business in or with the Republic of South Africa.

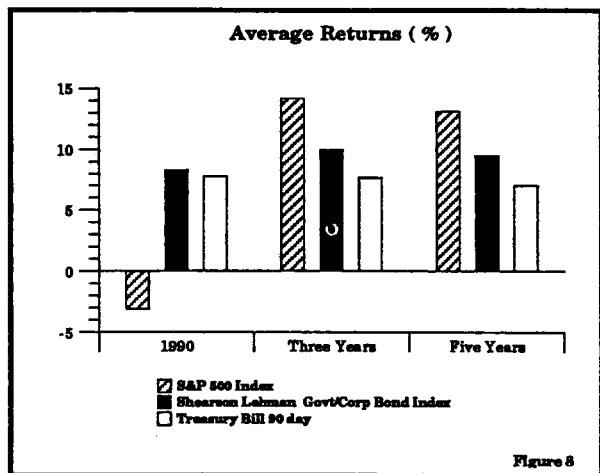
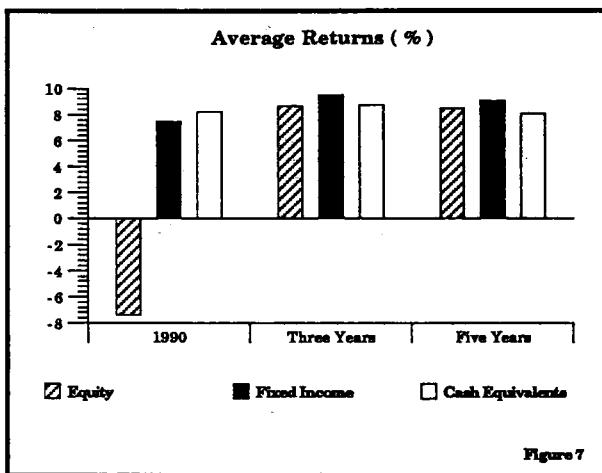
A small number of Retirement Boards continue to invest according to the so-called "Legal List". In these instances, funds must be invested:

- in fixed income obligations of the U.S. Government or its agencies;
- a maximum of 20% of the overall portfolio in fixed income obligations of railroad companies;
- a maximum of 35% of the overall portfolio in fixed income obligations of telephone companies;
- a maximum of 50% of the overall portfolio in fixed income obligations of public service companies;
- a maximum of 15% of the overall portfolio in industrial fixed income obligations; and
- a maximum of 25% of the overall portfolio in equities of banks and insurance companies.

Asset allocation as of 12/31/90 for all systems was 48.21% or \$5,793,589,229 in equities, 42.41% or \$5,096,513,060 in fixed income obligations and 9.38% or \$1,128,049,562 in short term obligations. This allocation is similar to that of public employee retirement systems elsewhere in the United States. (See Figures 5 and 6.)



On average, the total return of the Massachusetts Systems was 1.65% for 1990, 9.44% for 1988-1990, 8.83% for 1986-1990, and 10.97% for 1985-1990. Fixed income provided an average return of 7.49% for 1990, 9.50% for 1988-1990, 9.07% for 1986-1990, and 11.23% for 1985-1990. Equities provided an average return of -7.37% for 1990, 8.63% for 1988-1990, 8.43% for 1986-1990, and 13.97% for 1985-1990. These results are based on the performance of local Retirement Boards and exclude the performance of the State and Teachers' Retirement Systems. (See Figures 7 and 8.)



In addition to equities and fixed income, systems invest in mutual funds, limited partnerships, group trusts and other commingled investment vehicles including the Pension Reserves Investment Trust Fund. Ownership in such entities is on a share or unit basis and results are determined by changes in the share or unit values. This is particularly significant for systems investing through the PRIT Fund and the State Employees' Retirement System and the Teachers' Retirement System.

This represents the framework in which public pension funds are invested in Massachusetts. PERA continuously monitors the Boards' investment activities. In several instances, PERA has assisted Boards in recouping monies owed to them. To date, over \$1,500,000 has been recovered.

*Annual Report of the*  
**Massachusetts Contributory Retirement Systems**  
*for the year ending December 31, 1990*

Table Three

**Asset Class and Asset Allocation**

Page One

Retirement System	Returns						Allocations					
	Equity Return	Rank	Fixed Income Return	Rank	Cash equivalents Return	Rank	Equity Percent	Rank	Fixed Income Percent	Rank	Cash equivalents Percent	Rank
ADAMS	-5.90	61	8.81	32	8.43	61	25.49	83	52.80	44	21.71	24
AMESBURY	-6.55	64	9.31	11	6.65	105	21.45	93	53.06	43	25.49	14
ANDOVER	-6.92	69	6.40	83	8.49	58	41.42	36	48.51	56	10.08	63
ARLINGTON	-11.51	88	8.89	28	9.54	12	24.80	87	67.18	10	8.02	73
ATHOL	1.97	5	10.10	3	8.50	55	22.74	90	53.72	39	23.55	19
ATTLEBORO	-1.14	16	7.92	63	8.00	86	30.35	70	53.10	41	16.55	38
BARNSTABLE COUNTY	-10.89	85	7.88	65	8.92	39	44.19	35	14.46	85	41.35	1
BELMONT	-11.93	90	9.07	19	8.52	54	27.13	77	46.62	66	26.24	12
BERKSHIRE COUNTY	-26.47	106	7.27	77	9.33	22	6.99	105	52.66	46	40.35	2
BEVERLY	-5.73	55	9.01	23	9.63	9	45.15	33	43.66	71	11.19	58
BLUE HILLS REG VO	-11.17	87	8.80	34	8.33	70	21.15	94	67.73	8	11.13	59
BOSTON	-12.03	91	7.14	78	7.18	101	51.64	28	31.61	79	16.75	36
BRAINTREE	-9.71	81	4.18	89	8.41	63	12.46	100	60.81	18	26.73	10
BRISTOL COUNTY	1.96	6	7.94	62	9.04	36	39.09	43	47.14	61	13.77	46
BROCKTON	-14.42	96	6.06	86	7.35	98	34.00	58	44.85	69	21.15	28
BROOKLINE	-9.48	80	9.65	7	9.23	25	37.25	49	56.26	34	6.50	79
CAMBRIDGE	-9.17	79	7.40	73	8.32	72	57.24	25	19.02	83	23.74	18
CHELSEA	0.14	10	8.20	54	7.60	94	30.54	69	57.59	29	11.88	54
CHICOPEE	-8.12	77	10.01	5	10.00	3	27.67	76	50.75	50	21.57	27
CLINTON	-1.29	17	8.34	49	8.15	84	93.32	17	2.45	88	4.23	91
CONCORD	-2.70	35	8.17	56	8.34	68	36.27	53	53.26	40	10.47	60
DANVERS	-2.99	38	9.26	14	6.60	107	25.64	81	64.74	12	9.62	65
DEDHAM	-1.66	23	N/A	N/A	8.70	48	99.24	1	0.00	101	0.76	107
DUKES COUNTY	-10.76	84	7.91	64	8.38	65	53.05	27	25.22	82	21.72	23
EASTHAMPTON	3.55	1	9.04	22	7.98	87	13.01	99	77.37	3	9.62	66
ESSEX COUNTY	-4.12	44	8.74	38	8.97	38	31.48	64	41.99	72	26.53	11
EVERETT	-0.05	11	7.82	68	9.58	11	36.25	54	57.21	31	6.54	78

Table Three

## Asset Class and Asset Allocation

Page Two

<u>Retirement System</u>	<u>Returns</u>						<u>Allocations</u>					
	<u>Equity Return Rank</u>	<u>Fixed Income Return Rank</u>	<u>Cash equivalents Return Rank</u>	<u>Equity Percent Rank</u>	<u>Fixed Income Percent Rank</u>	<u>Cash equivalents Percent Rank</u>	<u>Equity Return Rank</u>	<u>Fixed Income Return Rank</u>	<u>Cash equivalents Return Rank</u>	<u>Equity Percent Rank</u>	<u>Fixed Income Percent Rank</u>	<u>Cash equivalents Percent Rank</u>
FAIRHAVEN	-1.87	31	N/A	N/A	7.36	97	94.79	13	0.00	105	5.21	85
FALL RIVER	-0.73	14	7.40	74	8.83	43	28.62	74	67.58	9	3.80	94
FALMOUTH	3.11	2	9.27	13	8.25	76	37.81	47	58.48	25	3.71	95
FITCHBURG	-2.93	37	8.86	29	9.11	30	25.38	84	54.41	37	20.22	32
FRAMINGHAM	-4.43	45	8.76	36	9.88	5	98.69	2	0.04	89	1.27	105
FRANKLIN COUNTY	-5.69	53	8.91	25	7.97	88	22.89	89	60.81	19	16.29	41
GARDNER	-1.37	18	N/A	N/A	10.71	2	88.46	20	0.00	103	11.54	55
GLoucester	-5.86	60	9.14	18	8.36	66	32.83	61	53.07	42	14.10	43
GREATER LAWRENCE	-15.72	100	9.75	6	9.33	23	21.52	92	57.77	27	20.71	29
GREENFIELD	-0.19	12	9.18	15	8.91	40	31.06	66	36.52	77	32.43	7
HAMPDEN COUNTY	-14.42	97	8.29	51	9.08	33	21.80	91	61.41	17	16.79	35
HAMPSHIRE COUNTY	-10.60	83	8.22	53	8.34	69	16.31	97	49.36	52	34.33	6
HAVERHILL	-13.98	95	8.51	45	8.07	85	32.25	62	51.16	48	16.59	37
HINGHAM	-2.35	34	1.82	90	9.05	35	96.59	7	0.00	95	3.41	97
HOLYOKE	-5.79	57	8.45	47	8.53	53	34.53	55	52.75	45	12.72	51
HULL	-28.07	107	8.25	52	7.96	89	6.62	106	61.59	16	31.79	8
LAWRENCE	-5.75	56	8.53	44	9.37	19	33.08	59	62.53	15	4.39	88
LEOMINSTER	-7.78	76	8.65	40	9.28	24	17.45	96	58.29	26	24.26	17
LEXINGTON	-5.70	54	10.08	4	9.23	26	48.32	31	46.19	67	5.49	83
LOWELL	-12.98	93	7.54	71	8.44	59	29.55	71	47.34	60	23.11	21
LYNN	-7.40	75	6.94	80	9.12	29	39.79	40	46.72	64	13.49	47
MALDEN	-5.36	50	7.01	79	7.14	102	48.55	30	43.93	70	7.52	75
MARBLEHEAD	-7.25	74	8.86	30	8.30	74	44.32	34	46.71	65	8.97	71
MARLBOROUGH	-6.51	62	8.75	37	8.65	50	31.54	63	59.01	24	9.45	67
MASS HOUSING FINA	-1.77	29	N/A	N/A	8.88	41	93.35	16	0.00	98	6.65	77
MASS PORT AUTH	-5.13	49	9.65	8	8.42	62	37.36	48	56.62	32	6.02	80
MASS TURNPIKE AUT	-23.41	104	7.28	76	8.32	73	1.25	107	76.70	4	22.05	22

Table Three

## Asset Class and Asset Allocation

Page Three

Retirement System	Returns						Allocations					
	Equity Return Rank		Fixed Income Return Rank		Cash equivalents Return Rank		Equity Percent Rank		Fixed Income Percent Rank		Cash equivalents Percent Rank	
MASS WATER RESOUR	-15.49	98	6.25	84	8.50	56	25.50	82	36.79	75	37.71	3
MAYNARD	-7.12	71	9.47	9	9.40	17	69.83	21	6.86	87	23.30	20
MEDFORD	-8.86	78	8.16	58	8.80	45	18.75	95	56.53	33	24.72	16
MELROSE	-10.52	82	8.81	33	8.17	82	24.83	86	49.32	54	25.85	13
METHUEN	-6.69	66	8.82	31	7.63	93	38.74	44	47.04	62	14.22	42
MIDDLESEX COUNTY	-11.13	86	8.40	48	8.68	49	41.22	38	47.44	59	11.34	56
MILFORD	2.16	3	8.17	57	8.25	77	38.33	45	48.47	57	13.20	48
MILTON	-1.67	24	N/A	N/A	8.20	80	90.86	19	0.00	100	9.14	69
MINUTEMAN REG VO	-1.74	27	N/A	N/A	9.64	8	92.47	18	0.00	99	7.53	74
MONTAGUE	-1.65	22	N/A	N/A	8.23	78	95.61	11	0.00	97	4.39	89
NATICK	-3.04	39	8.90	26	7.81	90	39.27	42	40.18	73	20.55	30
NEEDHAM	-1.75	28	N/A	N/A	9.46	14	95.92	9	0.00	92	4.08	93
NEW BEDFORD	-11.87	89	8.04	60	8.17	83	56.79	26	29.32	81	13.90	44
NEWBURYPORT	-4.49	46	9.31	12	7.58	95	25.37	85	54.51	36	20.12	33
NEWTON	-18.06	102	8.16	59	9.70	6	51.37	29	37.31	74	11.32	57
NORFOLK COUNTY	-1.73	26	N/A	N/A	9.43	16	95.18	12	0.00	94	4.82	86
NORTH ADAMS	-5.65	52	7.86	67	9.62	10	34.51	56	55.32	35	10.17	62
NORTH ATTLEBORO	-6.79	68	8.78	35	8.44	60	26.50	79	60.35	20	13.15	49
NORTHAMPTON	-5.49	51	9.17	16	9.49	13	39.87	39	51.08	49	9.05	70
NORTHBIDGE	-1.60	19	N/A	N/A	6.76	103	98.23	3	0.00	93	1.77	104
NORWOOD	-3.27	41	9.46	10	9.03	37	11.14	101	74.99	5	13.87	'45
PEABODY	-6.53	63	8.57	43	8.41	64	36.29	52	51.55	47	12.16	53
PITTSFIELD	-3.97	43	8.20	55	8.50	57	30.76	68	48.74	55	20.50	31
PLYMOUTH	2.07	4	7.88	66	11.11	1	39.38	41	59.49	22	1.13	106
PLYMOUTH COUNTY	-12.22	92	5.98	87	9.36	20	9.23	103	86.68	1	4.09	92
PRIM BOARD	-6.76	67	6.11	85	8.23	79	61.82	23	29.99	80	8.19	72
QUINCY	-4.69	47	8.59	41	9.10	32	36.80	50	46.82	63	16.38	39

Table Three

**Asset Class and Asset Allocation**

Page Four

<b>Retirement System</b>	<b>Returns</b>						<b>Allocations</b>					
	<b>Equity Return</b>	<b>Rank</b>	<b>Fixed Income Return</b>	<b>Rank</b>	<b>Cash equivalents Return</b>	<b>Rank</b>	<b>Equity Percent</b>	<b>Rank</b>	<b>Fixed Income Percent</b>	<b>Rank</b>	<b>Cash equivalents Percent</b>	<b>Rank</b>
READING	-1.79	30	N/A	N/A	7.32	99	94.27	15	0.00	96	5.73	81
REVERE	-25.15	105	7.76	69	7.39	96	8.25	104	54.36	38	37.40	4
SALEM	-5.80	58	6.94	81	9.07	34	27.81	75	59.90	21	12.29	52
SAUGUS	-1.64	20	N/A	N/A	7.78	91	96.32	8	0.00	104	3.68	96
SHREWSBURY	-1.99	32	N/A	N/A	9.11	31	97.65	4	0.00	106	2.35	102
SOMERVILLE	-2.75	36	12.70	1	9.36	21	69.08	22	9.32	86	21.60	25
SOUTHBIDGE	-4.70	48	5.81	88	8.33	71	29.28	72	45.46	68	25.26	15
SPRINGFIELD	-0.21	13	8.34	50	8.74	46	32.88	60	57.72	28	9.40	68
STATE	0.44	9	N/A	N/A	6.67	104	95.71	10	0.00	102	4.29	90
STATE TEACHERS	1.32	8	N/A	N/A	7.21	100	96.95	6	0.00	107	3.05	99
STONEHAM	-7.17	72	9.07	20	8.20	81	31.00	67	59.30	23	9.71	64
SWAMPSMOTT	-3.26	40	8.01	61	6.61	106	36.73	51	50.26	51	13.01	50
TAUNTON	-3.29	42	9.07	21	8.83	44	31.08	65	67.01	11	1.91	103
WAKEFIELD	-1.99	33	N/A	N/A	8.35	67	97.58	5	0.00	90	2.42	101
WALTHAM	-1.64	21	7.64	70	9.69	7	37.95	46	57.35	30	4.69	87
WATERTOWN	-16.99	101	8.94	24	8.61	52	28.69	73	63.91	13	7.40	76
WEBSTER	-13.09	94	10.52	2	8.65	51	61.71	24	18.87	84	19.42	34
WELLESLEY	-7.17	73	8.71	39	9.46	15	41.32	37	48.32	58	10.37	61
WEST SPRINGFIELD	-5.84	59	8.48	46	9.13	28	24.00	88	70.59	6	5.41	84
WESTFIELD	1.85	7	7.51	72	8.27	75	26.86	78	36.75	76	36.38	5
WEYMOUTH	-1.72	25	N/A	N/A	9.40	18	94.31	14	0.00	91	5.69	82
WINCHESTER	-1.00	15	8.59	42	8.85	42	34.30	57	49.34	53	16.36	40
WINTHROP	-6.95	70	6.80	82	9.93	4	26.42	80	70.24	7	3.34	98
WOBURN	-15.54	99	9.17	17	7.72	92	9.64	102	62.79	14	27.57	9
WORCESTER	-6.60	65	7.37	75	8.71	47	46.27	32	32.14	78	21.58	26
WORCESTER COUNTY	-20.90	103	8.90	27	9.17	27	13.79	98	83.41	2	2.81	100

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Table Four

**Past Years by Asset Class ( Annualized )**

Page One

Retirement System	Equity .....						Fixed Income .....					
	Five years		Three years		Since January 1985		Five years		Three years		Since January 1985	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
ADAMS	-4.37	106	2.39	95	2.82	104	9.92	21	9.45	59	12.18	27
AMESBURY	8.88	48	12.38	17	15.65	22	9.15	59	9.87	35	10.82	74
ANDOVER	4.61	86	11.53	29	9.12	85	9.53	34	9.87	36	12.41	24
ARLINGTON	10.46	29	10.50	38	12.90	52	9.11	65	9.37	65	11.09	70
ATHOL	11.74	14	16.98	3	20.21	4	8.74	79	9.38	64	9.96	94
ATTLEBORO	12.87	5	13.58	10	17.23	11	8.26	88	9.01	82	10.06	93
BARNSTABLE COUNTY	1.33	95	2.05	97	6.14	95	5.77	99	9.34	66	8.42	101
BELMONT	6.81	70	11.64	25	10.23	81	9.04	71	8.97	84	11.28	58
BERKSHIRE COUNTY	-1.11	100	-3.51	103	6.87	94	9.37	41	9.15	76	11.68	43
BEVERLY	4.66	85	4.76	88	10.60	79	9.26	47	10.55	13	11.86	34
BLUE HILLS REG VO	9.09	44	7.94	75	11.66	62	9.78	25	10.34	21	9.38	96
BOSTON	8.37	56	9.61	48	12.90	53	9.78	26	10.59	10	12.05	30
BRAINTREE	9.11	43	9.36	57	13.51	45	8.81	78	8.87	88	11.45	51
BRISTOL COUNTY	5.46	80	8.11	72	10.71	77	9.18	54	9.94	33	10.73	76
BROCKTON	3.48	90	3.09	91	8.39	88	9.16	56	8.66	91	11.34	55
BROOKLINE	15.24	1	11.26	32	21.86	1	9.19	53	10.56	12	10.73	77
CAMBRIDGE	2.35	91	2.41	94	9.38	84	9.11	66	10.19	23	11.87	33
CHELSEA	8.93	47	12.10	19	12.64	57	8.56	82	9.28	70	11.28	59
CHICOPEE	6.56	73	8.18	70	14.49	36	8.62	81	10.26	22	10.48	87
CLINTON	0.70	98	3.56	90	8.99	86	9.25	48	11.15	5	11.55	45
CONCORD	9.72	36	13.21	12	9.72	83	9.22	52	9.82	40	11.23	64
DANVERS	9.33	38	14.03	7	15.08	25	9.05	70	9.66	46	10.46	88
DEDHAM	7.96	59	7.96	74	11.06	74	8.40	86	9.10	79	13.03	13
DUKES COUNTY	0.77	97	2.75	93	8.11	90	6.86	98	9.30	69	9.26	98
EASTHAMPTON	14.54	2	21.74	1	19.61	6	10.43	11	10.94	7	12.70	16
ESSEX COUNTY	10.18	30	10.35	40	16.08	20	8.84	76	9.49	56	11.82	37
EVERETT	12.00	11	13.43	11	16.25	17	8.47	84	9.13	77	10.55	82

Table Four

## Past Years by Asset Class ( Annualized )

Page Two

Retirement System	Equity .....						Fixed Income .....					
	Five years Return	Rank	Three years Return	Rank	Since January 1985 Return	Rank	Five years Return	Rank	Three years Return	Rank	Since January 1985 Return	Rank
FAIRHAVEN	10.13	31	9.30	61	14.66	32	3.68	100	N/A	N/A	10.53	83
FALL RIVER	12.78	7	13.68	8	16.26	16	8.82	77	8.90	86	11.71	41
FALMOUTH	8.56	54	16.19	4	11.28	67	9.90	22	10.44	19	11.76	39
FITCHBURG	8.67	52	12.34	18	13.44	48	9.85	24	10.52	15	12.78	15
FRAMINGHAM	7.43	65	7.91	76	14.46	37	9.46	36	9.72	44	10.86	72
FRANKLIN COUNTY	3.84	89	7.40	81	5.82	98	9.13	62	9.66	47	10.83	73
GARDNER	8.84	49	9.44	52	11.19	70	19.55	3	N/A	N/A	21.83	6
GLoucester	10.69	26	10.87	36	16.44	14	8.45	85	9.56	52	11.49	48
GREATER LAWRENCE	1.67	93	2.14	96	1.67	106	7.78	92	10.03	28	7.78	102
GREENFIELD	11.23	18	10.66	37	11.23	69	9.08	67	9.50	55	10.51	85
HAMPDEN COUNTY	10.74	24	8.52	68	19.83	5	9.03	72	9.76	43	10.50	86
HAMPSHIRE COUNTY	12.22	10	10.33	41	17.44	10	9.08	68	9.43	60	10.70	79
HAVERHILL	11.97	12	8.13	71	15.00	26	10.26	15	9.72	45	12.97	14
HINGHAM	8.83	50	11.50	30	15.16	24	9.15	60	9.06	80	11.49	49
HOLYOKE	10.62	28	9.49	49	20.68	3	9.08	69	9.23	73	11.38	54
HULL	-3.29	105	-5.13	105	3.54	102	9.23	51	9.11	78	11.47	50
LAWRENCE	0.86	96	6.09	86	3.86	101	9.49	35	10.15	25	11.92	32
LEOMINSTER	7.74	61	7.80	78	14.11	40	10.11	19	10.39	20	12.45	22
LEXINGTON	5.79	79	7.18	82	14.60	33	10.01	20	11.26	4	12.13	28
LOWELL	3.98	87	-2.03	101	13.53	44	9.59	32	9.56	53	11.57	44
LYNN	6.75	72	11.23	33	11.06	75	9.29	45	8.88	87	11.43	52
MALDEN	7.19	67	13.61	9	11.71	60	9.45	37	8.73	89	11.21	65
MARBLEHEAD	5.16	82	10.21	43	11.39	65	9.31	43	9.41	61	10.73	78
MARLBOROUGH	5.81	78	10.09	45	13.26	50	7.46	94	9.40	62	9.22	99
MASS HOUSING FINA	8.33	57	9.30	62	8.33	89	10.89	9	N/A	N/A	12.55	19
MASS PORT AUTH	12.46	8	12.99	13	15.17	23	10.55	10	10.06	26	12.28	26
MASS TURNPIKE AUT	1.61	94	2.85	92	3.51	103	11.02	7	10.55	14	13.79	10

Table Four

## Past Years by Asset Class ( Annualized )

Page Three

<u>Retirement System</u>	Equity .....						Fixed Income .....					
	Five years		Three years		Since January 1985		Five years		Three years		Since January 1985	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
MASS WATER RESOUR	7.72	62	7.72	79	N/A	N/A	8.21	89	8.21	92	N/A	N/A
MAYNARD	0.46	99	0.18	100	8.04	91	8.52	83	10.46	16	10.45	89
MEDFORD	9.43	37	11.29	31	13.98	42	9.44	38	9.87	37	11.25	62
MELROSE	11.54	15	11.87	23	14.81	29	9.63	30	9.98	30	11.98	31
METHUEN	6.16	76	8.28	69	12.90	54	9.01	73	8.98	83	10.66	80
MIDDLESEX COUNTY	9.05	46	10.29	42	13.32	49	9.70	28	9.77	42	11.85	36
MILFORD	7.42	66	11.21	34	11.69	61	7.21	96	10.45	17	9.34	97
MILTON	13.84	3	9.39	54	20.70	2	16.97	4	N/A	N/A	21.73	7
MINUTEMAN REG VO	11.04	19	9.35	59	11.12	73	N/A	N/A	N/A	N/A	N/A	N/A
MONTAGUE	10.83	23	9.41	53	14.94	27	24.51	2	N/A	N/A	19.06	8
NATICK	11.82	13	17.22	2	18.25	7	8.74	80	9.18	75	10.81	75
NEEDHAM	10.91	21	9.38	56	14.06	41	N/A	N/A	N/A	N/A	37.34	2
NEW BEDFORD	-2.20	104	1.13	99	4.78	99	7.29	95	9.49	57	10.26	90
NEWBURYPORT	6.92	69	11.74	24	14.52	35	9.29	46	9.82	41	11.21	66
NEWTON	4.68	84	6.16	85	10.08	82	9.31	44	10.06	27	11.53	47
NORFOLK COUNTY	10.06	32	9.28	63	16.09	19	10.30	14	N/A	N/A	22.74	5
NORTH ADAMS	6.45	74	12.00	22	12.53	58	9.40	40	9.28	71	11.54	46
NORTH ATTLEBORO	6.13	77	7.99	73	10.35	80	8.86	75	9.96	32	10.52	84
NORTHAMPTON	6.40	75	11.56	27	11.13	72	9.16	57	9.66	48	10.62	81
NORTHBRIDGE	7.01	68	9.28	64	11.32	66	12.32	5	55.34	1	16.75	9
NORWOOD	10.71	25	12.75	14	14.22	38	9.72	27	9.85	39	11.26	60
PEABODY	9.92	33	9.76	46	16.64	13	8.36	87	9.66	49	11.00	71
PITTSFIELD	8.72	51	11.54	28	14.79	30	9.61	31	9.31	68	11.75	40
PLYMOUTH	4.79	83	10.46	39	13.48	47	9.69	29	10.84	9	12.43	23
PLYMOUTH COUNTY	2.30	92	1.90	98	8.57	87	9.13	63	9.86	38	11.70	42
PRIM BOARD	10.90	22	10.10	44	13.65	43	9.25	49	9.06	81	11.77	38
QUINCY	6.77	71	5.83	87	12.77	56	7.16	97	8.69	90	9.13	100

Table Four

## Past Years by Asset Class ( Annualized )

Page Four

Retirement System	Equity						Fixed Income					
	Five years		Three years		Since January 1985		Five years		Three years		Since January 1985	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
READING	5.36	81	11.04	35	11.17	71	7.87	91	3.20	93	12.68	17
REVERE	-1.87	103	-2.91	102	4.61	100	9.57	33	9.52	54	12.08	29
SALEM	8.29	58	3.86	89	11.24	68	9.13	64	8.95	85	11.86	35
SAUGUS	7.64	63	9.39	55	7.64	92	65.59	1	N/A	N/A	42.57	1
SHREWSBURY	10.92	20	9.36	58	13.25	51	N/A	N/A	N/A	N/A	32.33	4
SOMERVILLE	9.18	40	7.45	80	16.27	15	7.58	93	12.70	2	10.14	92
SOUTHBRIDGE	-7.52	107	-13.76	107	1.84	105	9.17	55	9.27	72	11.42	53
SPRINGFIELD	12.39	9	15.89	5	18.25	8	9.37	42	9.39	63	11.14	68
STATE	9.22	39	9.45	51	11.57	63	N/A	N/A	N/A	N/A	N/A	N/A
STATE TEACHERS	9.14	41	9.71	47	11.49	64	N/A	N/A	N/A	N/A	N/A	N/A
STONEHAM	9.12	42	7.91	77	14.83	28	9.88	23	10.19	24	12.31	25
SWAMPSCOTT	7.95	60	14.74	6	14.70	31	9.43	39	9.98	31	11.25	63
TAUNTON	13.77	4	12.06	21	18.00	9	10.31	13	10.45	18	12.51	20
WAKEFIELD	10.66	27	9.13	65	13.49	46	N/A	N/A	N/A	N/A	35.53	3
WALTHAM	11.53	16	12.40	16	15.78	21	9.15	61	9.23	74	11.10	69
WATERTOWN	9.79	34	6.28	84	12.17	59	7.89	90	9.65	50	9.85	95
WEBSTER	-1.65	101	-4.87	104	6.05	96	10.90	8	11.55	3	11.26	61
WELLESLEY	8.59	53	9.09	66	10.95	76	11.27	6	11.08	6	13.26	12
WEST SPRINGFIELD	7.56	64	12.74	15	7.56	93	8.90	74	10.03	29	10.20	91
WESTFIELD	12.84	6	12.07	20	16.69	12	9.25	50	9.58	51	11.32	56
WEYMOUTH	11.25	17	9.34	60	14.13	39	N/A	N/A	N/A	N/A	N/A	N/A
WINCHESTER	8.48	55	9.47	50	16.14	18	10.21	17	10.57	11	12.65	18
WINTHROP	9.73	35	11.60	26	10.69	78	9.16	58	9.32	67	11.20	67
WOBURN	3.85	88	6.37	83	12.78	55	10.26	16	9.89	34	13.30	11
WORCESTER	9.08	45	8.74	67	14.57	34	10.13	18	9.48	58	11.30	57
WORCESTER COUNTY	-1.81	102	-7.42	106	5.93	97	10.39	12	10.91	8	12.46	21

### **PART III:**

#### **ASSET GROWTH AND EMPLOYEE AND EMPLOYER CONTRIBUTIONS**

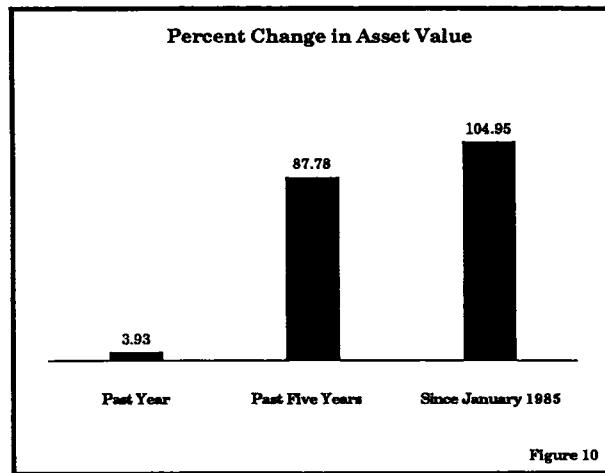
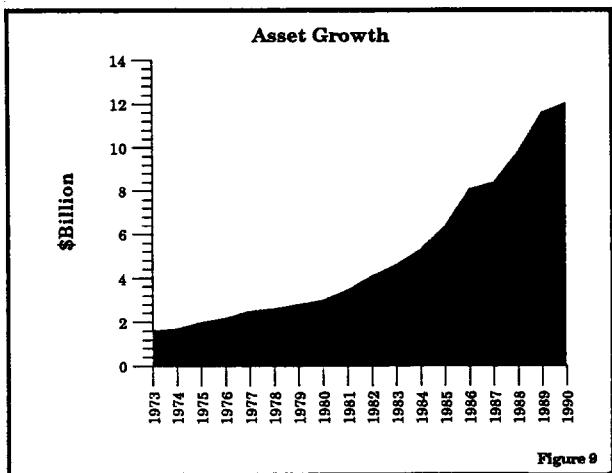
In accordance with Chapter 32 of the General Laws, PERA establishes the annual pension appropriation which must be contributed by each county, city and town. These funds are deposited in the accounts of the retirement system and used to pay benefits. Each member of the system also contributes a percentage of salary to the system. Upon retirement, an individual receives a retirement allowance consisting of two components, an annuity based on contributions and a pension paid from the employer's appropriation.

The law authorizes additional employer contributions as a method of reducing unfunded liabilities. In addition, so-called "excess earnings", the yield on investments above the amount needed to credit interest to employee annuity accounts, are deposited in the system.

These are the primary sources of the funds which are invested by Retirement Boards. It is the goal of the investment activity to reduce the unfunded liabilities of the retirement systems.

Since 1973, significant asset growth has taken place throughout the retirement systems. On 12/31/73, assets totalled \$1.6 billion. As of 12/31/90, that total was over \$12 billion, an increase of 651%. Assets should continue to grow in the future due to increased contributions and investment return. (See Figures 9 and 10.)

The rate of growth in assets and the funding status of the retirement system is intimately linked. In order for asset growth to dampen the impact of increasing liabilities, the expected return of 8% per year must be achieved. In the 1985-1990 period, 98 of 105 systems exceeded 8% return. On average, the return has been 1.65% for one year, 9.44% for three years, 8.83% for five years, and 10.97% for six years.



As of 12/31/90, the five systems with the largest asset base were State Teachers', State Employees', Boston, Middlesex County, and Worcester. In 1990, asset growth was greatest in Massachusetts Water Resources Authority, Southbridge, Milford, Athol, and Woburn. In the last five years, the most significant asset growth took place in Minuteman Regional Vocational Technical School, Wellesley, Falmouth, Easthampton, and Methuen.

Asset growth is attributable to several factors including employee and employer contributions. However, growth in the market value of assets due to investment return represents a major source of increased financial stability in the retirement system.

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Table Five

**Asset Growth**

Page One

<u>Retirement System</u>	<u>December 31, 1990</u>			<u>Percent Change</u>					
	<u>Total Asset Value</u>		<u>Market</u>	<u>Past Year</u>		<u>Past Five Years</u>	<u>Percent Rank</u>	<u>Since January 1, 1985</u>	
	<u>Market</u>	<u>Rank</u>		<u>Percent</u>	<u>Rank</u>			<u>Percent</u>	<u>Rank</u>
ADAMS	5,590,638.71	94		6.93	48	95.24	21	183.83	10
AMESBURY	9,414,958.38	86		8.39	32	80.50	45	174.29	12
ANDOVER	15,891,314.12	68		8.31	33	100.58	17	167.48	15
ARLINGTON	41,612,560.93	27		4.01	67	72.41	68	113.87	69
ATHOL	4,265,168.81	100		17.07	4	111.25	10	130.10	42
ATTLEBORO	16,043,990.18	67		7.56	38	87.25	34	135.13	35
BARNSTABLE COUNTY	64,217,726.74	17		7.20	42	75.66	55	116.68	63
BELMONT	19,473,658.67	58		6.21	52	45.91	98	88.68	90
BERKSHIRE COUNTY	19,879,985.52	57		10.99	17	76.72	53	131.86	41
BEVERLY	21,886,570.23	54		4.24	65	72.33	69	116.37	65
BLUE HILLS REG VO	2,573,272.01	105		1.74	84	69.01	74	101.43	82
BOSTON	948,165,074.89	4		-0.67	98	81.43	41	123.76	51
BRAINTREE	32,301,846.59	38		3.88	71	124.01	7	200.35	6
BRISTOL COUNTY	62,865,024.52	19		11.47	11	75.15	56	124.64	48
BROCKTON	58,893,360.46	20		0.13	93	47.98	97	87.61	91
BROOKLINE	51,369,555.10	21		5.52	57	73.65	62	106.50	77
CAMBRIDGE	110,210,717.72	9		1.83	82	52.05	92	112.20	71
CHELSEA	17,301,272.16	61		6.94	47	62.30	84	106.61	76
CHICOPEE	35,586,288.47	34		15.39	6	50.22	96	84.52	93
CLINTON	4,499,299.32	99		-0.53	97	37.22	101	80.18	96
CONCORD	12,871,491.08	75		8.72	30	76.65	54	114.36	67
DANVERS	22,783,491.15	52		-5.18	103	65.86	78	98.85	84
DEDHAM	11,878,100.67	78		-0.32	94	70.01	71	121.09	53
DUKES COUNTY	5,410,901.17	96		9.63	23	79.55	48	117.81	61
EASTHAMPTON	7,131,607.36	93		13.35	9	132.50	5	205.37	5
ESSEX COUNTY	51,329,685.60	22		9.75	21	72.86	67	116.57	64
EVERETT	24,182,909.49	49		0.46	91	57.36	89	83.29	94

Table Five

## Asset Growth

Page Two

<u>Retirement System</u>	<u>December 31, 1990</u>			<u>Percent Change</u>						
	<u>Total Asset Value</u>		<u>Market</u>	<u>Rank</u>	<u>Past Year</u>		<u>Past Five Years</u>		<u>Since January 1, 1985</u>	
	<u>Percent</u>	<u>Rank</u>			<u>Percent</u>	<u>Rank</u>	<u>Percent</u>	<u>Rank</u>	<u>Percent</u>	<u>Rank</u>
FAIRHAVEN	5,411,754.17	95			2.10	80	81.24	42	113.95	68
FALL RIVER	64,132,507.32	18			8.02	37	91.77	26	151.60	25
FALMOUTH	14,393,279.42	70			14.72	7	137.62	4	189.01	9
FITCHBURG	24,804,958.98	48			8.14	34	80.54	43	150.55	27
FRAMINGHAM	35,675,841.12	33			7.03	45	75.14	57	123.96	50
FRANKLIN COUNTY	11,966,925.44	77			10.01	20	78.19	51	126.12	45
GARDNER	8,893,819.11	88			0.82	89	69.26	73	109.79	74
GLoucester	16,970,404.06	62			7.01	46	78.05	52	132.62	40
GREATER LAWRENCE	2,357,481.89	106			9.07	26	94.70	22	117.54	62
GREENFIELD	8,684,848.82	89			10.62	18	91.51	27	136.35	34
HAMPDEN COUNTY	49,324,483.38	24			3.99	69	78.27	50	124.89	47
HAMPSHIRE COUNTY	31,467,842.58	39			9.48	24	71.76	70	107.94	75
HAVERHILL	36,132,379.27	31			3.90	70	102.15	16	164.73	17
HINGHAM	11,545,921.88	82			6.36	50	54.81	90	86.28	92
HOLYOKE	40,470,984.14	29			3.78	72	62.11	86	103.85	80
HULL	4,865,000.04	97			4.24	66	50.39	95	74.26	100
LAWRENCE	35,933,475.84	32			1.65	85	63.33	83	110.32	73
LEOMINSTER	16,496,623.16	66			7.07	44	89.44	31	143.86	31
LEXINGTON	22,457,783.24	53			6.19	53	72.98	65	123.98	49
LOWELL	44,707,624.19	26			2.60	76	53.43	91	89.41	89
LYNN	66,482,041.58	16			2.05	81	93.36	25	159.04	19
MALDEN	25,495,673.32	46			1.05	88	41.61	99	75.19	99
MARBLEHEAD	13,328,868.14	73			2.22	79	32.36	103	65.16	104
MARLBOROUGH	13,922,768.46	72			7.09	43	73.44	63	136.97	33
MASS HOUSING FINA	11,681,397.90	81			6.23	51	114.34	9	156.08	20
MASS PORT AUTH	84,914,129.25	13			8.50	31	99.71	18	155.04	21
MASS TURNPIKE AUT	71,285,197.04	15			11.26	12	117.89	8	189.38	8

Table Five

## Asset Growth

Page Three

<u>Retirement System</u>	December 31, 1990				Percent Change			
	Total Asset Value		Market	Rank	Past Year		Past Five Years	Since January 1, 1985
	Market	Rank			Percent	Rank	Percent	Rank
MASS WATER RESOUR	10,124,797.15	84			56.80	1	N/A	N/A
MAYNARD	3,935,633.27	101			-1.92	101	35.61	102
MEDFORD	35,040,756.91	35			8.05	35	83.02	40
MELROSE	16,960,763.06	63			3.14	74	65.71	79
METHUEN	18,305,313.04	59			8.93	28	124.21	6
MIDDLESEX COUNTY	184,618,307.51	5			4.75	60	80.07	46
MILFORD	11,754,871.67	80			17.80	3	86.96	35
MILTON	16,847,582.68	65			1.77	83	66.86	77
MINUTEMAN REG VO	2,122,876.27	107			4.49	63	174.28	2
MONTAGUE	3,413,348.67	103			3.14	75	72.92	66
NATICK	23,548,388.40	50			5.80	55	89.57	30
NEEDHAM	29,393,617.18	42			0.52	90	74.74	59
NEW BEDFORD	45,876,239.36	25			-10.13	105	29.61	104
NEWBURYPORT	8,612,965.00	90			11.01	16	87.92	33
NEWTON	85,669,329.82	12			-4.81	102	27.38	105
NORFOLK COUNTY	112,690,117.85	7			1.15	87	89.03	32
NORTH ADAMS	9,324,691.74	87			6.00	54	84.21	38
NORTH ATTLEBORO	10,888,082.59	83			7.28	40	105.80	13
NORTHAMPTON	11,785,471.91	79			8.94	27	61.35	87
NORTHBIDGE	3,433,599.38	102			11.20	13	58.54	88
NORWOOD	32,696,482.17	37			9.66	22	106.48	12
PEABODY	33,079,489.04	36			5.19	58	91.50	28
PITTSFIELD	29,973,655.72	40			8.87	29	51.69	93
PLYMOUTH	21,633,246.48	55			11.16	14	105.01	14
PLYMOUTH COUNTY	107,248,903.04	10			10.55	19	86.71	36
PRIM BOARD	2,959,090,171.48	3			2.29	78	182.53	1
QUINCY	74,345,871.90	14			5.55	56	67.43	76

Table Five

## Asset Growth

Page Four

<u>Retirement System</u>	December 31, 1990			Percent Change.....					
	Total Asset Value <u>Market</u>	<u>Rank</u>		Past Year Percent Rank		Past Five Years Percent Rank		Since January 1, 1985 Percent Rank	
READING	15,463,489.38	69		2.43	77	68.15	75	119.05	56
REVERE	25,177,793.44	47		7.23	41	85.09	37	126.12	46
SALEM	27,772,564.76	43		-0.69	99	74.86	58	116.00	66
SAUGUS	9,687,596.49	85		-16.42	107	62.19	85	82.10	95
SHREWSBURY	12,667,959.57	76		1.17	86	83.68	39	133.34	38
SOMERVILLE	40,639,587.59	28		-8.10	104	39.61	100	97.38	87
SOUTHBRIDGE	4,537,435.40	98		22.85	2	69.82	72	71.01	103
SPRINGFIELD	110,478,138.95	8		11.52	10	78.51	49	117.91	59
STATE	3,873,330,400.57	2		3.54	73	103.19	15	219.66	4
STATE TEACHERS	3,968,773,768.16	1		4.49	64	90.60	29	167.71	14
STONEHAM	14,086,719.93	71		-0.33	95	65.25	80	117.87	60
SWAMPSCOTT	8,003,169.70	91		4.75	61	74.35	60	118.51	57
TAUNTON	29,801,393.09	41		4.81	59	97.45	19	150.35	28
WAKEFIELD	16,944,897.70	64		-0.40	96	73.16	64	104.33	79
WALTHAM	50,087,153.21	23		6.74	49	93.49	23	143.72	32
WATERTOWN	23,269,749.44	51		0.37	92	74.09	61	121.94	52
WEBSTER	3,176,520.49	104		-13.76	106	26.86	106	45.84	106
WELLESLEY	40,107,220.36	30		4.75	62	163.43	3	267.86	3
WEST SPRINGFIELD	12,951,028.00	74		11.04	15	51.47	94	72.40	101
WESTFIELD	26,626,587.06	44		13.44	8	111.02	11	169.52	13
WEYMOUTH	26,296,895.07	45		9.45	25	95.86	20	106.23	78
WINCHESTER	18,004,157.86	60		8.03	36	93.47	24	151.41	26
WINTHROP	7,207,402.56	92		-1.72	100	63.50	82	79.02	97
WOBURN	21,208,980.63	56		16.35	5	80.51	44	133.94	36
WORCESTER	137,928,096.92	6		4.00	68	80.07	47	117.97	58
WORCESTER COUNTY	100,072,365.09	11		7.45	39	64.10	81	119.25	55

**PART IV:**  
**COMMISSIONS, TRADING VOLUME, MANAGEMENT FEES,  
AND TURNOVER**

The intent of this part of the report is to focus attention on the expense involved in the trading activity of the Boards. Every purchase or sale of a holding by a retirement system is executed by a brokerage firm. The broker's role is to match buyers and sellers. These firms also consummate trades through the use of their own capital or by trading their own holdings from the firm's inventory. In such instances, the firm receives compensation through changes in the market value of the security involved and no explicit commission is received. The following table is for domestic transactions only.

In addition to trading, some brokers provide clients with advice relating to stock and bond selections. That advice may cover the full spectrum of investment options or may focus on one category.

In most systems, the responsibility for day to day management of the portfolio is delegated to professional money managers. PERA requires that such managers meet strict standards. Costs related to this management may be paid from investment earnings or paid through appropriation. The actual return of those systems paying such expenses from appropriation will not be reduced by such costs. However, nationwide and in Massachusetts the use of investment earnings is the most common method of paying these costs.

In evaluating the effect of these costs on performance, PERA is seeking to make systems aware of the need to consider these expenses when assessing manager performance.

The same is true in analyzing the amount of buying and selling in which a manager engages. Turnover rates must be judged based on the performance of the portfolio. High turnover rates increase transaction costs, consequently, a high level of buying and selling must be justified by performance. As a general principal, such turnover does not enhance performance, however, each manager must be assessed on his or her performance.

Information regarding expenses was derived from the records of the retirement systems and the PRIT Fund. Those systems which invest in mutual funds, limited partnerships, group trusts and other commingled vehicles do not always record detailed expenses with respect to those investments.

Commissions, trading volume and management fee information was unavailable with respect to the State Employees' Retirement System and the Teachers' Retirement System. With respect to these systems and local systems participating in PRIT, the turnover data reflects the purchase and redemption of trust units and does not reflect the buying and selling of stocks and bonds.

Statewide in 1990, excluding returns of the State Employees' and Teachers' Retirement Systems, the gross return was .99% and the net return .65%. This difference of .34% is the equivalent of \$10,857,320.83. Appropriations paid an additional \$955,656.05 in expenses. These expenses exclude the expenses of the State Employees' and Teachers' Retirement Systems.

*Annual Report of the*  
**Massachusetts Contributory Retirement Systems**  
*for the year ending December 31, 1990*

**Commissions and Trading Volume for Calendar Year 1990**

Table Six

**Excluding State Employees and Teachers Retirement Systems**

**Page One**

<u>Broker</u>	<u>Stock \$ Volume</u>	<u>Stock \$ Commissions</u>	<u>Commission Per Share</u>	<u>Fixed Income \$ Volume</u>	<u>Fixed Income \$ Commissions</u>
A G EDWARDS AND S	3,372,209.00	4,395.50	0.06	15,969,760.54	0.00
A H WILLIAMS	0.00	0.00	0.00	896,000.00	0.00
ABEL NOSER	4,506,329.29	6,593.88	0.06	0.00	0.00
ABNER HERMAN & BR	715,649.98	1,538.00	0.06	0.00	0.00
ADAMS, HARKNESS A	6,883,743.45	9,399.32	0.06	2,369,149.35	0.00
ADLER COLEMAN & C	450,700.00	700.00	0.07	0.00	0.00
ADVEST, INC.	2,051,200.94	4,067.00	0.06	0.00	0.00
ALEX, BROWN AND S	54,901,173.03	118,120.68	0.07	24,398,703.01	0.00
ARNHOLD & BLEICHR	1,117,343.75	0.00	0.00	0.00	0.00
ASIEL & CO.	82,620.00	0.00	0.00	240,468.75	0.00
AUBREY G. LANGSTO	0.00	0.00	0.00	4,475,086.84	0.00
AUTRANET, INC	20,658,528.60	33,567.26	0.06	720,652.50	465.00
BALIS & ZORN	1,654,064.20	3,396.00	0.06	0.00	0.00
BANK OF BOSTON	0.00	0.00	0.00	311,523.43	0.00
BANK OF NEW ENGLA	0.00	0.00	0.00	1,698,109.94	0.00
BANKERS TRUST	30,643.60	303.10	0.10	3,424,711.55	62.50
BANQUE NATIONALE	0.00	0.00	0.00	1,088,139.30	0.00
BARCLAYS BANK INT	114,062.50	0.00	0.00	1,799,011.72	0.00
BARCLAYS, DE ZOETE	32,572.40	84.00	0.06	5,176,644.71	0.00
BARING BROTHERS L	687,654.40	4,075.36	0.07	0.00	0.00
BARING SECS. LTD,	28,441.27	218.91	0.05	0.00	0.00
BARING SECS., NY	362,663.90	1,614.08	0.03	0.00	0.00
BATEMAN, EICHLER	0.00	0.00	0.00	103,162.50	0.00
BEAR STEARNS AND	71,125,494.23	136,162.77	0.06	152,797,589.86	0.00
BERNSTEIN & CO	32,344,013.54	64,592.00	0.05	0.00	0.00

### Commissions and Trading Volume for Calendar Year 1990

Table Six

**Excluding State Employees and Teachers Retirement Systems**

Page Two

<u>Broker</u>	<u>Stock \$ Volume</u>	<u>Stock \$ Commissions</u>	<u>Commission Per Share</u>	<u>Fixed Income \$ Volume</u>	<u>Fixed Income \$ Commissions</u>
BHC SECURITIES IN	126,484.22	378.00	0.12	0.00	0.00
BLAIR,WILLIAM, &	1,013,403.50	990.00	0.07	0.00	0.00
BOSTON COMPANY	60,365.50	78.00	0.06	0.00	0.00
BOSTON INSTITUTIO	350,877.17	263.00	0.07	12,801,342.20	0.00
BOSTON SAFE DEPOS	0.00	0.00	0.00	395,991.25	0.00
BRANDT,ROBERT & C	1,865,368.28	827.00	0.01	0.00	0.00
BRIDGE TRADING CO	16,017,385.33	26,070.00	0.06	0.00	0.00
BROADCOURT SECURI	87,973,937.62	144,206.00	0.06	0.00	0.00
BROWN BROTHERS HA	1,143,639.99	2,243.00	0.06	4,545,450.79	0.00
BT SECURITIES COR	21,496.29	0.00	0.00	3,418,437.50	62.50
BURNS, PAULI, & C	410,797.60	386.00	0.07	0.00	0.00
BURTON & LENCE IN	156,042.60	126.00	0.06	0.00	0.00
BZW SECURITIES	637,268.59	2,543.74	0.05	0.00	0.00
C.L. KING & ASSOC	94,286.85	210.00	0.07	0.00	0.00
CANADA TRUST	325,963.20	0.00	0.00	0.00	0.00
CANADIAN IMPERIAL	134,323.00	162.00	0.06	0.00	0.00
CANTELLA & CO.	1,842,182.08	1,875.00	0.05	0.00	0.00
CANTOR FITZGERALD	27,719,940.15	40,298.26	0.04	50,500.00	0.00
CAPITAL INST'L SV	1,701,273.52	4,914.00	0.05	65,151,405.93	10,431.03
CARROLL-MCENTEE +	0.00	0.00	0.00	43,209,321.31	0.00
CHARTERHOUSE TINL	623,430.17	1,611.98	0.03	0.00	0.00
CHASE MANHATTAN B	1,000,000.00	0.00	0.00	16,633,528.50	0.00
CHASE MANHATTAN S	31,326.34	32.00	0.08	0.00	0.00
CHEMICAL BANK	0.00	0.00	0.00	2,618,359.38	0.00
CHICAGO RESEARCH	0.00	0.00	0.00	838,880.84	0.00
CITIBANK	0.00	0.00	0.00	677,597.66	0.00

### Commissions and Trading Volume for Calendar Year 1990

Table Six

**Excluding State Employees and Teachers Retirement Systems**

Page Three

<u>Broker</u>	<u>Stock \$ Volume</u>	<u>Stock \$ Commissions</u>	<u>Commission Per Share</u>	<u>Fixed Income \$ Volume</u>	<u>Fixed Income \$ Commissions</u>
CITICORP SECURITI	0.00	0.00	0.00	3,512,830.00	0.00
CL GLAZER INC	4,028,528.93	5,900.00	0.06	0.00	0.00
CL GLOBAL SECURIT	3,253,028.48	4,643.50	0.05	0.00	0.00
COUNTY NAT WEST	909,133.91	2,718.96	0.03	0.00	0.00
COUNTY SECURITIES	8,811,985.21	22,410.00	0.05	0.00	0.00
COWEN & CO	18,046,323.83	35,462.21	0.06	3,491,854.50	0.00
CREDIT LYONNAIS	112,958.42	1,116.73	0.04	0.00	0.00
CYRUS J LAWRENCE	14,841,172.76	29,104.30	0.06	3,032,343.75	0.00
D & D TOLHURST	420,987.00	1,280.00	0.08	0.00	0.00
DAIN BOSWORTH INC	99,533.88	152.00	0.07	0.00	0.00
DAIWA SECURITIES	563,031.20	700.00	0.07	0.00	0.00
DAVIS,MENDEL & RE	749,764.40	1,174.00	0.07	0.00	0.00
DEAN WITTER REYNO	23,393,972.71	43,261.00	0.06	36,690,265.41	0.00
DELAFIELD,HARVEY+	174,265.59	536.00	0.09	0.00	0.00
DEUTSCHE BANK	366,272.00	560.00	0.07	0.00	0.00
DILLON, READ & CO	92,890.00	0.00	0.00	23,961,136.10	0.00
DISCOUNT COOP OF	0.00	0.00	0.00	6,452,007.82	0.00
DLJ FIXED INCOME	383,906.25	0.00	0.00	48,740,807.93	0.00
DOMINIC & DOMINIC	1,256,408.71	858.00	0.06	1,610,517.50	0.00
DOMINION SECURITI	317,016.00	816.00	0.06	0.00	0.00
DONALDSON LUFKIN	19,491,930.90	46,383.83	0.07	54,812,168.77	0.00
DREXEL BURNHAM LA	4,453,245.09	4,464.00	0.05	19,297,460.30	0.00
ENSKILDA SECURITI	199,513.71	0.00	0.00	0.00	0.00
ERNST & CO	39,227,543.74	83,630.29	0.06	0.00	0.00
EXECUTION SERVICE	26,003,868.93	37,119.68	0.05	0.00	0.00
FACTSET DATA SYST	10,704,131.05	18,449.00	0.06	0.00	0.00

**Commissions and Trading Volume for Calendar Year 1990**

**Table Six**

**Excluding State Employees and Teachers Retirement Systems**

**Page Four**

<b><u>Broker</u></b>	<b><u>Stock \$ Volume</u></b>	<b><u>Stock \$ Commissions</u></b>	<b><u>Commission Per Share</u></b>	<b><u>Fixed Income \$ Volume</u></b>	<b><u>Fixed Income \$ Commissions</u></b>
FAHNESTOCK & CO	10,004,347.89	27,853.00	0.06	0.00	0.00
FANUEIL HALL SECU	3,290,234.66	11,850.08	0.06	0.00	0.00
FBOST-FIRST BOSTO	0.00	0.00	0.00	191,364.44	0.00
FERRIS,BAKER,WATT	1,289,113.93	1,854.00	0.06	0.00	0.00
FIDELITY BROKERAG	16,566,426.00	44,335.40	0.08	0.00	0.00
FINANCIAL CLEARIN	0.00	0.00	0.00	3,807,343.75	0.00
FIRST ALBANY	32,925,777.25	66,962.88	0.07	23,952,748.34	456.50
FIRST AUSTRIAN	128,019.05	0.00	0.00	0.00	0.00
FIRST BOSTON CORP	38,717,050.14	51,637.46	0.06	159,156,730.84	0.00
FIRST MANHATTAN C	9,206,736.56	16,098.00	0.06	0.00	0.00
FIRST PACIFIC	54,807.24	613.29	0.06	0.00	0.00
FIRST TENNESSEE B	0.00	0.00	0.00	1,285,886.40	0.00
FOX-PITT, KELTON,	113,488.41	192.00	0.08	0.00	0.00
FREEMAN SECURITIE	0.00	0.00	0.00	4,096,681.71	0.00
FREIMARK,BLAIR&CO	826,336.48	1,032.00	0.06	0.00	0.00
FURMAN, SELZ, MAG	1,719,321.51	1,367.00	0.06	0.00	0.00
G.X. CLARK	0.00	0.00	0.00	3,128,691.74	0.00
GAGE, WILEY & CO	686,875.53	3,356.65	0.10	1,552,849.90	0.00
GL GLOBAL PARTNER	221,775.00	150.00	0.05	0.00	0.00
GLICKEN HAUS	115,000.00	0.00	0.00	0.00	0.00
GOLDMAN, SACHS AN	83,516,050.29	100,206.47	0.06	144,774,863.90	0.00
GOLDSMITH & HARRI	0.00	0.00	0.00	613,781.25	0.00
GORDAN CAPITAL	30,304.21	0.00	0.00	0.00	0.00
GORDON CAPITAL	25,462.32	636.00	0.06	0.00	0.00
GORDON HASKET	15,305,162.75	32,550.05	0.07	2,945,000.00	0.00
GORDON SECURITIES	257,100.00	700.00	0.07	0.00	0.00

**Commissions and Trading Volume for Calendar Year 1990**

Table Six

**Excluding State Employees and Teachers Retirement Systems**

**Page Five**

<u>Broker</u>	<u>Stock \$ Volume</u>	<u>Stock \$ Commissions</u>	<u>Commission Per Share</u>	<u>Fixed Income \$ Volume</u>	<u>Fixed Income \$ Commissions</u>
GOWELL SECURITIES	999,625.58	1,520.40	0.04	0.00	0.00
GREENWICH CAPITAL	0.00	0.00	0.00	5,105,529.69	0.00
GREENWICH OPTIONS	0.00	0.00	0.00	4,568,716.76	0.00
GREENWICH SECURIT	0.00	0.00	0.00	1,431,897.03	0.00
GRUNTAL + CO	269,649.00	324.00	0.06	80,750.00	0.00
HAHN HOLND GROSM	140,439.00	414.00	0.06	0.00	0.00
HAIGNEY SECURITIE	75,107.03	48.00	0.07	0.00	0.00
HAMBRECHT & QUIST	650,016.12	690.00	0.07	0.00	0.00
HERZOG HEINE	5,826,074.17	735.00	0.06	0.00	0.00
HOLT & COLLINS	426,897.90	2,568.00	0.08	0.00	0.00
HOWARD,WEIL,& LAB	540,839.90	365.00	0.05	0.00	0.00
HUGH JOHNSON & CO	0.00	0.00	0.00	2,412,844.75	0.00
INGALLS & SNYDER	170,238.00	238.00	0.07	0.00	0.00
INSTINET	46,151,108.65	28,466.97	0.01	0.00	0.00
INTERSTATE SECURI	191,734.64	710.00	0.06	0.00	0.00
IRVING TRUST	0.00	0.00	0.00	1,004,372.00	0.00
ITT FINANCIAL SER	105,715.50	165.00	0.05	0.00	0.00
J.C.BRADFORD & CO	93,846.95	140.00	0.07	0.00	0.00
J.P. MORGAN SECUR	0.00	0.00	0.00	6,515,661.02	0.00
JANNEY, MONTGOMER	530,124.79	1,080.00	0.06	0.00	0.00
JARDINE FLEMMING	3,265,310.45	2,875.19	0.05	0.00	0.00
JEFFERIES	40,246,458.97	45,404.24	0.04	11,758,164.25	0.00
JESUP & LAMONT	25,090.15	64.00	0.08	150,187.50	0.00
JOHNSON LANE	13,505.54	18.00	0.06	218,946.00	0.00
JONES ASSOCIATES	1,327,042.57	2,253.00	0.07	0.00	0.00
JOSEPHTHAL AND CO	530,733.28	720.00	0.08	396,875.00	0.00

### Commissions and Trading Volume for Calendar Year 1990

Table Six

Excluding State Employees and Teachers Retirement Systems

Page Six

<u>Broker</u>	<u>Stock \$ Volume</u>	<u>Stock \$ Commissions</u>	<u>Commission Per Share</u>	<u>Fixed Income \$ Volume</u>	<u>Fixed Income \$ Commissions</u>
KALB, VOORHIS & C	2,248,154.28	1,675.00	0.04	0.00	0.00
KEMPER CLEARING C	0.00	0.00	0.00	4,432,086.78	0.00
KEMPR-KEMPER CLEA	0.00	0.00	0.00	519,584.46	0.00
KIDDER PEABODY AN	149,878,665.93	287,893.16	0.06	173,993,863.42	100.00
KLEINWORTH, GRIEV	993,420.00	720.00	0.06	0.00	0.00
LAZARD FRERES AND	0.00	0.00	0.00	195,137.50	0.00
LEGG MASON WOOD	5,597,533.22	7,714.00	0.08	23,659,501.25	0.00
LEHMAN BROS.	0.00	0.00	0.00	37,353,016.87	0.00
LEHMAN GOVERNMENT	0.00	0.00	0.00	9,882,253.17	0.00
LEHMAN SPECIAL SE	0.00	0.00	0.00	11,331,119.13	0.00
LEWCO SEC (HAMBRE	2,079,009.11	2,197.00	0.05	0.00	0.00
LEWCO SECS (WERTH	18,225,804.96	33,375.50	0.06	365,000.00	0.00
LEWCO SECURITIES	9,313,052.27	13,144.00	0.07	1,105,125.00	0.00
LIPPER ANALYTCL D	3,861,457.04	8,696.00	0.06	0.00	0.00
LOVETT,UNDERWOOD,	390,900.00	900.00	0.06	0.00	0.00
LYNCH, JONES & RY	90,297,616.84	227,621.36	0.06	18,589,709.56	0.00
M E GOLDSTEIN & C	0.00	0.00	0.00	1,249,645.00	0.00
M L,PIERCE,FENNER	813,605.68	405.00	0.06	24,229,982.01	0.00
MABON NAUGHT & CO	0.00	0.00	0.00	3,306,211.48	0.00
MABON NUGENT & CO	10,750,118.15	28,204.00	0.05	2,475,335.10	0.00
MANUFACTURERS HA	0.00	0.00	0.00	3,123,406.14	0.00
MC CORTNEY-BRECKE	0.00	0.00	0.00	2,010,625.00	0.00
MCCAUGHAN DYSON	889,728.96	0.00	0.00	0.00	0.00
MCDONALD & CO.	63,244.59	119.00	0.07	0.00	0.00
MCGRAW HILL SECUR	38,065.00	250.00	0.05	0.00	0.00
MCLAUGHLIN, PIVEN	151,947,538.52	0.00	0.00	51,798,239.29	0.00

### Commissions and Trading Volume for Calendar Year 1990

Table Six

**Excluding State Employees and Teachers Retirement Systems**

**Page Seven**

<b>Broker</b>	<b>Stock \$ Volume</b>	<b>Stock \$ Commissions</b>	<b>Commission Per Share</b>	<b>Fixed Income \$ Volume</b>	<b>Fixed Income \$ Commissions</b>
MERRILL LYNCH	87,475,212.63	118,204.10	0.06	348,546,457.88	2,775.00
MERRILL LYNCH GOV	0.00	0.00	0.00	32,844,612.15	0.00
MIDWEST SECURITIE	333,354.00	980.00	0.07	0.00	0.00
MONTGOMERY SECUR	30,422,933.23	44,441.00	0.06	299,000.00	0.00
MOORS AND CABOT,	0.00	0.00	0.00	927,720.00	0.00
MORAN & CO INC	345,700.00	700.00	0.07	0.00	0.00
MORGAN GRENFELL	149,500.00	0.00	0.00	1,013,030.94	0.00
MORGAN GUARANTY T	1,593,488.83	0.00	0.00	179,032.68	0.00
MORGAN KEEGAN	0.00	0.00	0.00	1,176,521.00	0.00
MORGAN STANLEY &	30,282,293.32	47,283.68	0.06	293,112,324.84	0.00
MURPHY & DURIEU	3,813,595.00	3,270.00	0.06	21,802,419.60	0.00
MURPHY, MARSEILLE	873,172.50	1,110.00	0.06	0.00	0.00
NATIONAL FINANCIA	14,731,001.11	51,307.58	0.07	5,598,296.82	379.00
NATIONAL WESTMINS	99,234.35	0.00	0.00	0.00	0.00
NESBITT THOMPSON	22,579.67	0.00	0.00	0.00	0.00
NEUBERGER & BERMA	6,364,957.45	5,030.00	0.04	0.00	0.00
NEWBRIDGE SECURIT	387,411.98	2,800.00	0.04	0.00	0.00
NOMURA SECURITIES	754,688.28	1,418.00	0.07	1,240,045.69	0.00
O S L SECURITIES	0.00	0.00	0.00	1,454,960.00	0.00
OFTRING AND COMPA	0.00	0.00	0.00	1,003,573.56	0.00
OPPENHEIMER AND C	23,909,628.12	50,884.95	0.07	8,000.00	0.00
OSCAR GRUSS & SON	18,413,874.64	16,181.62	0.02	0.00	0.00
OSE SAMPLE LYNCH	0.00	0.00	0.00	1,442,343.75	0.00
P A GRAVER	0.00	0.00	0.00	5,151,937.02	0.00
PAINE WEBBER	169,613,706.58	297,359.94	0.06	86,298,141.96	0.00

**Commissions and Trading Volume for Calendar Year 1990**  
**Excluding State Employees and Teachers Retirement Systems**

Table Six

Page Eight

<u>Broker</u>	<u>Stock \$ Volume</u>	<u>Stock \$ Commissions</u>	<u>Commission Per Share</u>	<u>Fixed Income \$ Volume</u>	<u>Fixed Income \$ Commissions</u>
PEREGRINE	86,677.10	320.00	0.08	0.00	0.00
PERSHING CORP	24,159,569.72	41,606.60	0.06	8,454,712.15	0.00
PHILLIPS & DREW	222,465.00	750.00	0.05	4,450,049.80	0.00
PIPER, JAFFREY	417,697.34	930.00	0.04	5,194,517.66	0.00
PRESCOTT, BALL AN	3,037,250.34	6,752.00	0.07	9,789,391.88	0.00
PRINTON KANE + CO	1,292,820.74	1,248.50	0.06	6,197,875.03	0.00
PROVIDENT NATL BK	142,247.79	400.00	0.10	0.00	0.00
PRUDENTIAL BACHE	41,751,076.60	76,529.50	0.06	159,879,571.34	0.00
PURCELL, GRAHAM,	1,379,613.00	2,700.00	0.06	0.00	0.00
QUADREX SECURITIE	0.00	0.00	0.00	1,766,066.03	0.00
R.D. SMITH CO, IN	0.00	0.00	0.00	731,250.00	0.00
R.L. CRARY & COMP	0.00	0.00	0.00	522,343.75	0.00
R.S. HUDSON & CO	0.00	0.00	0.00	999,375.00	0.00
RAYMOND JAMES	359,765.47	678.00	0.07	1,390,696.15	0.00
REFCO PARTNERS	0.00	0.00	0.00	498,945.31	0.00
REYNDERS GRAY & C	172,206.33	609.00	0.06	0.00	0.00
RICHARDSON GREENS	0.00	0.00	0.00	207,687.50	0.00
ROBERT W.B.	1,027,002.72	1,440.00	0.06	0.00	0.00
ROBERTSON SECURIT	113,250.00	0.00	0.00	0.00	0.00
ROBINSON HUMPHRE	1,099,278.29	1,919.00	0.05	0.00	0.00
ROCHDALE SEC CORP	52,988.50	215.00	0.05	0.00	0.00
RODMAN & RENSHAW	0.00	0.00	0.00	1,404,390.95	0.00
ROTAN MOSLE INC	0.00	0.00	0.00	1,924,843.75	0.00
ROTHSCHILD INC.	925,703.91	3,221.00	0.07	0.00	0.00
ROULSTON RESEARCH	2,171,068.98	2,618.00	0.06	0.00	0.00

**Commissions and Trading Volume for Calendar Year 1990**  
**Excluding State Employees and Teachers Retirement Systems**

Table Six

Page Nine

<u>Broker</u>	<u>Stock \$ Volume</u>	<u>Stock \$ Commissions</u>	<u>Commission Per Share</u>	<u>Fixed Income \$ Volume</u>	<u>Fixed Income \$ Commissions</u>
SALOMON BROTHERS	38,549,959.66	53,873.53	0.05	248,269,517.57	0.00
SALOMON INTERNATI	352,137.81	720.82	0.03	19,062.50	0.00
SANFORD BERNSTEIN	7,199,967.63	10,918.00	0.06	0.00	0.00
SANWA BANK	0.00	0.00	0.00	1,605,995.63	0.00
SANWA-BGK SECURIT	0.00	0.00	0.00	2,114,548.69	0.00
SANYO	209,280.00	480.00	0.06	0.00	0.00
SASSOON OVERSEAS,	630,201.70	0.00	0.00	0.00	0.00
SCOTIA MCLEOD INC	40,713.43	135.26	0.08	0.00	0.00
SECURITIES SETTLE	562,075.21	860.00	0.05	231,700.00	0.00
SEI FINANCIAL SER	25,080,539.92	64,274.00	0.06	0.00	0.00
SHAW DATA SECURIT	576,282.93	1,363.00	0.09	0.00	0.00
SHAWMUT BANK	0.00	0.00	0.00	20,000.00	0.00
SHEARSON - AMERIC	21,192,409.81	16,380.04	0.07	155,416,262.52	750.00
SHEARSON LEHMAN B	83,837,362.12	117,028.94	0.06	133,227,382.59	0.00
SMITH BARNEY	23,401,098.24	35,798.25	0.05	123,788,013.93	0.00
STANDARD & POORS	4,355,843.79	10,092.00	0.06	0.00	0.00
STATE STREET BK +	11,312,116.28	0.00	0.00	11,317,001.25	0.00
STIFEL NICOLAUS &	392,610.00	360.00	0.06	0.00	0.00
SUTRO & CO	2,425,783.78	4,806.00	0.06	0.00	0.00
THE CITATION GROU	548,354.69	2,090.00	0.11	216,780.00	0.00
TRADESAVER INSTIT	1,807,347.66	4,545.88	0.10	0.00	0.00
TROSTER SINGER	569,772.85	0.00	0.00	0.00	0.00
TUCKER, ANTHONY A	11,641,156.58	23,065.50	0.06	12,186,697.73	0.00
UBS DB CORP	0.00	0.00	0.00	570,946.56	0.00
UBS PHILLIPS & DR	549,868.33	1,092.07	0.02	5,329,812.50	0.00

## Commissions and Trading Volume for Calendar Year 1990

Table Six

**Excluding State Employees and Teachers Retirement Systems**

Page Ten

<u>Broker</u>	<u>Stock \$ Volume</u>	<u>Stock \$ Commissions</u>	<u>Commission Per Share</u>	<u>Fixed Income \$ Volume</u>	<u>Fixed Income \$ Commissions</u>
UBS SECURITIES	2,480,372.20	360.00	0.06	27,412,556.69	0.00
UBS SECURITIES, I	958,345.40	840.00	0.06	40,213,281.81	0.00
UCSB SECURITIES C	0.00	0.00	0.00	445,710.94	0.00
ULTRAFIN INTERNAT	447,443.88	175.00	0.07	0.00	0.00
UNION BANK OF SWI	175,432.08	0.00	0.00	0.00	0.00
W&D SECURITIES	7,010,786.19	9,311.00	0.06	0.00	0.00
WAGNER STOTT & CO	22,183,780.65	43,853.44	0.06	17,594,905.30	0.00
WARBURG	6,094,322.50	7,098.73	0.05	1,037,585.54	0.00
WARBURG BRINKMAN	32,615.35	0.00	0.00	0.00	0.00
WARBURG ROWE & PI	284,486.75	364.50	0.07	0.00	0.00
WEEDEN & CO	9,215,528.92	11,136.24	0.07	0.00	0.00
WEISS PECK & GREE	5,868,850.81	14,360.00	0.06	749,531.25	0.00
WELLINGTON, H.G.	155,944.79	300.00	0.06	0.00	0.00
WERTHEIM AND CO	8,843,327.02	20,674.43	0.09	4,998,028.25	0.00
WERTHEIM SCHRODE	961,360.24	2,215.00	0.10	0.00	0.00
WESSELLS ARNOLD &	228,819.41	0.00	0.00	0.00	0.00
WESTCAP SECURITIE	0.00	0.00	0.00	478,984.38	0.00
WESTPAC AUSTRALIA	0.00	0.00	0.00	246,992.19	0.00
WESTPAC POLLOCK G	0.00	0.00	0.00	5,343,385.02	0.00
WHEAT FIRST SECUR	3,990,357.18	7,301.30	0.06	787,617.50	0.00
WILLIAM BLAIR & C	1,375,397.90	2,220.00	0.06	0.00	0.00
WILLIAM E POLLACK	0.00	0.00	0.00	12,077,900.89	0.00
WILLIAM ONEIL AND	500,025.31	3,824.50	0.04	0.00	0.00
WILSHIRE ASSOCIAT	18,080,161.23	34,491.00	0.07	0.00	0.00
WOOD GUNDY	364,318.26	1,810.00	0.04	0.00	0.00

*Annual Report of the*  
**Massachusetts Contributory Retirement Systems**  
*for the year ending December 31, 1990*

Table Seven

**Gross and Net Performance / Management Fees**

Page One

<b>Retirement System</b>	<b>..... Gross and Net Performance .....</b>			<b>Management Fees .....</b>		
	<b>Gross</b>	<b>Net</b>	<b>Basis Point Difference</b>	<b>Paid from Expense Fund</b>	<b>Paid from Earnings</b>	<b>As a Percent of Market Value</b>
ADAMS	5.37	5.11	0.26	0.00	12,871.00	0.23
AMESBURY	5.21	4.93	0.28	0.00	23,622.90	0.25
ANDOVER	-0.12	-0.39	0.27	0.00	40,000.00	0.25
ARLINGTON	3.11	2.67	0.43	0.00	166,556.13	0.40
ATHOL	7.91	7.54	0.37	0.00	13,243.09	0.31
ATTLEBORO	5.27	5.27	0.00	36,466.70	0.00	0.23
BARNSTABLE COUNT	-1.32	-1.75	0.44	0.00	273,610.34	0.43
BELMONT	0.41	-0.14	0.54	0.00	96,868.99	0.50
BERKSHIRE COUNTY	5.08	5.06	0.02	0.00	3,398.00	0.02
BEVERLY	1.65	1.21	0.44	0.00	87,478.36	0.40
BLUE HILLS REG V	3.83	3.17	0.66	0.00	15,763.79	0.61
BOSTON	-2.82	-3.02	0.20	68,200.00	2,108,411.86	0.23
BRAINTREE	2.68	2.31	0.37	0.00	110,128.65	0.34
BRISTOL COUNTY	6.01	5.77	0.24	0.00	139,089.03	0.22
BROCKTON	-0.91	-1.31	0.40	0.00	231,038.98	0.39
BROOKLINE	1.54	1.12	0.42	0.00	198,194.96	0.39
CAMBRIDGE	0.02	-0.46	0.48	0.00	526,294.81	0.48
CHELSEA	5.70	5.44	0.26	0.00	40,999.85	0.24
CHICOPEE	4.39	3.95	0.43	0.00	133,637.51	0.38
CLINTON	-0.18	-0.18	0.00	0.00	0.00	0.00
CONCORD	4.48	4.47	0.01	36,932.14	1,737.00	0.30
DANVERS	5.79	5.78	0.01	38,822.33	1,584.00	0.18
DEDHAM	-1.64	-2.18	0.54	0.00	64,284.00	0.54
DUKES COUNTY	-1.61	-1.75	0.13	6,877.36	7,289.04	0.26
EASTHAMPTON	8.20	8.05	0.15	27,924.53	9,074.38	0.52
ESSEX COUNTY	4.56	4.56	0.00	159,100.00	0.00	0.31
EVERETT	5.57	5.34	0.23	0.00	50,920.57	0.21

Table Seven

**Gross and Net Performance / Management Fees**

Page Two

<b>Retirement System</b>	<b>..... Gross and Net Performance .....</b>			<b>Management Fees .....</b>		
	<b>Gross</b>	<b>Net</b>	<b>Basis Point Difference</b>	<b>Paid from Expense Fund</b>	<b>Paid from Earnings</b>	<b>As a Percent of Market Value</b>
FAIRHAVEN	-1.44	-1.97	0.52	0.00	27,465.00	0.51
FALL RIVER	6.14	5.92	0.22	0.00	132,197.66	0.21
FALMOUTH	7.09	6.84	0.25	0.00	34,260.34	0.24
FITCHBURG	5.24	5.24	0.00	29,103.00	0.00	0.12
FRAMINGHAM	4.94	4.70	0.24	9,157.50	81,141.86	0.25
FRANKLIN COUNTY	5.61	5.29	0.31	14,015.00	35,000.00	0.41
GARDNER	-1.22	-1.76	0.54	0.00	45,744.00	0.51
GLoucester	3.89	3.33	0.56	0.00	89,009.00	0.52
GREATER LAWRENCE	3.80	3.24	0.55	0.00	12,401.68	0.53
GREENFIELD	5.92	5.83	0.09	0.00	6,728.00	0.08
HAMPDEN COUNTY	2.24	1.85	0.39	0.00	186,228.04	0.38
HAMPSHIRE COUNTY	4.88	4.66	0.23	0.00	65,994.63	0.21
HAVERHILL	1.30	0.86	0.43	0.00	150,348.06	0.42
HINGHAM	-1.32	-1.67	0.35	0.00	39,228.88	0.34
HOLYOKE	3.50	3.11	0.40	0.00	153,576.00	0.38
HULL	3.23	3.01	0.22	0.00	9,686.43	0.20
LAWRENCE	3.22	2.55	0.67	0.00	231,889.00	0.65
LEOMINSTER	5.19	5.19	0.00	13,477.00	0.00	0.08
LEXINGTON	2.05	1.63	0.42	0.00	85,128.43	0.38
LOWELL	1.39	1.03	0.36	0.00	153,128.37	0.34
LYNN	0.12	-0.11	0.23	0.00	144,242.00	0.22
MALDEN	0.21	-0.06	0.27	0.00	69,466.00	0.27
MARBLEHEAD	0.81	0.81	0.00	38,909.00	0.00	0.29
MARLBOROUGH	4.21	3.77	0.44	0.00	57,642.00	0.41
MASS HOUSING FIN	-1.67	-2.20	0.53	0.00	58,966.00	0.50
MASS PORT AUTH	4.32	4.32	0.00	0.00	0.00	0.00
MASS TURNPIKE AU	6.88	6.88	0.00	41,800.00	0.00	0.06

Table Seven

**Gross and Net Performance / Management Fees**

Page Three

<u>Retirement System</u>	<u>..... Gross and Net Performance .....</u>			<u>Management Fees .....</u>		
	<u>Gross</u>	<u>Net</u>	<u>Basis Point Difference</u>	<u>Paid from Expense Fund</u>	<u>Paid from Earnings</u>	<u>As a Percent of Market Value</u>
MASS WATER RESOU	-1.02	-1.64	0.61	0.00	54,311.75	0.54
MAYNARD	-3.33	-3.57	0.24	0.00	9,354.63	0.24
MEDFORD	5.07	4.86	0.21	0.00	66,469.00	0.19
MELROSE	3.12	2.85	0.27	0.00	40,947.51	0.24
METHUEN	2.43	2.28	0.15	37,514.00	26,042.00	0.35
MIDDLESEX COUNTY	1.83	1.40	0.43	0.00	770,736.89	0.42
MILFORD	5.77	5.76	0.00	27,724.81	201.97	0.24
MILTON	-1.59	-2.13	0.54	0.00	87,568.00	0.52
MINUTEMAN REG VO	-1.55	-2.08	0.53	0.00	10,729.00	0.51
MONTAGUE	-1.34	-1.87	0.53	0.00	17,009.00	0.50
NATICK	3.47	3.28	0.19	0.00	38,265.67	0.16
NEEDHAM	-1.55	-2.09	0.54	0.00	156,648.00	0.53
NEW BEDFORD	-3.36	-3.77	0.42	0.00	215,329.68	0.47
NEWBURYPORT	5.07	4.77	0.30	0.00	23,108.53	0.27
NEWTON	-4.57	-4.85	0.28	0.00	245,185.93	0.29
NORFOLK COUNTY	-1.16	-1.68	0.52	0.00	583,261.00	0.52
NORTH ADAMS	2.31	2.03	0.29	0.00	25,229.00	0.27
NORTH ATTLEBORO	3.07	2.62	0.45	0.00	43,531.99	0.40
NORTHAMPTON	2.24	1.94	0.30	0.00	33,005.00	0.28
NORTHBIDGE	-1.51	-2.04	0.53	0.00	17,360.00	0.51
NORWOOD	6.60	6.43	0.17	0.00	48,836.43	0.15
PEABODY	3.01	2.61	0.41	0.00	127,597.00	0.39
PITTSFIELD	4.79	4.38	0.41	0.00	111,495.00	0.37
PLYMOUTH	6.89	6.82	0.06	8,000.00	11,614.99	0.09
PLYMOUTH COUNTY	4.08	4.08	0.00	1,642.48	0.00	0.00
PRIM BOARD	-2.27	-2.78	0.51	0.00	15,601,557.00	0.53
QUINCY	4.09	3.69	0.40	0.00	286,526.46	0.39

Table Seven

**Gross and Net Performance / Management Fees**

Page Four

<u>Retirement System</u>	<u>..... Gross and Net Performance .....</u>			<u>Management Fees .....</u>		
	<u>Gross</u>	<u>Net</u>	<u>Basis Point Difference</u>	<u>Paid from Expense Fund</u>	<u>Paid from Earnings</u>	<u>As a Percent of Market Value</u>
READING	-1.67	-2.21	0.54	0.00	78,894.00	0.51
REVERE	3.71	3.71	0.00	30,324.54	.00	0.12
SALEM	3.31	2.73	0.58	0.00	158,725.74	0.57
SAUGUS	-1.32	-1.85	0.53	0.00	56,829.00	0.59
SHREWSBURY	-1.68	-2.21	0.54	0.00	66,808.00	0.53
SOMERVILLE	0.94	0.40	0.54	9,391.00	230,693.70	0.59
SOUTHBRIDGE	3.55	3.12	0.43	0.00	17,653.00	0.39
SPRINGFIELD	5.76	5.67	0.10	23,750.00	94,166.67	0.11
* STATE	0.44	0.44	0.00	0.00	0.00	0.00
* STATE TEACHERS	1.95	1.95	0.00	0.00	0.00	0.00
STONEHAM	3.41	2.88	0.53	0.00	70,730.00	0.50
SWAMPSCOTT	2.37	2.11	0.27	0.00	20,126.00	0.25
TAUNTON	5.49	5.08	0.41	0.00	112,185.03	0.38
WAKEFIELD	-1.48	-2.01	0.53	0.00	89,204.00	0.53
WALTHAM	4.46	4.46	0.00	82,601.79	0.00	0.16
WATERTOWN	0.21	-0.11	0.32	0.00	70,551.00	0.30
WEBSTER	-0.92	-1.17	0.25	0.00	8,394.20	0.26
WELLESLEY	2.66	2.66	0.00	198,159.08	0.00	0.49
WEST SPRINGFIELD	4.30	4.13	0.17	0.00	19,277.00	0.15
WESTFIELD	5.11	5.05	0.06	0.00	13,937.43	0.05
WEYMOUTH	-1.49	-2.02	0.54	0.00	135,399.00	0.51
WINCHESTER	5.51	5.08	0.43	0.00	66,737.23	0.37
WINTHROP	3.41	3.27	0.14	0.00	9,491.50	0.13
WOBURN	5.62	5.46	0.16	0.00	29,644.00	0.14
WORCESTER	1.56	1.40	0.16	0.00	208,641.28	0.15
WORCESTER COUNTY	3.72	3.70	0.02	0.00	23,300.00	0.02

\* See Additional Information

*Annual Report of the  
Massachusetts Contributory Retirement Systems  
for the year ending December 31, 1990*

Table Eight

**Portfolio Turnover**

Page One

<b>Retirement System</b>	<b>Equity Turnover</b>				<b>Fixed Income Turnover</b>			
	Total Purchases	% of Market Value	Total Sales	% of Market Value	Total Purchases	% of Market Value	Total Sales	% of Market Value
ADAMS	810,650.33	57.10	451,029.94	31.77	1,258,959.85	43.58	910,882.86	31.53
AMESBURY	1,222,834.00	60.75	1,339,452.45	66.54	0.00	0.00	842,171.10	17.23
ANDOVER	7,474,797.31	113.90	4,528,196.37	69.00	5,026,146.21	66.51	6,159,569.76	81.51
ARLINGTON	5,071,078.33	49.28	2,949,348.19	28.66	9,874,863.61	36.12	7,889,250.80	28.85
ATHOL	365,085.00	38.79	344,450.57	36.60	1,131,287.88	50.22	766,589.32	34.03
ATTLEBORO	2,234,185.50	45.96	1,774,557.07	36.50	4,581,331.96	55.10	4,297,067.19	51.68
BARNSTABLE COUNTY	12,108,475.10	42.70	11,419,866.22	40.27	8,526,098.89	93.72	9,432,923.04	103.69
BELMONT	5,402,626.92	102.43	5,396,328.35	102.31	11,499,482.05	129.76	11,014,362.71	124.28
BERKSHIRE COUNTY	28,579.14	2.07	1,099.06	0.08	4,499,143.99	43.86	871,049.47	8.49
BEVERLY	4,844,875.91	49.08	2,534,852.29	25.68	9,786,716.63	103.77	7,871,111.92	83.46
BLUE HILLS REG VO	44,785.70	8.25	23,953.93	4.41	305,543.56	17.88	235,620.70	13.79
BOSTON	329,327,957.75	67.42	262,400,299.84	53.72	332,501,369.12	113.34	320,233,027.78	109.16
BRAINTREE	1,239,474.60	30.91	2,074,884.36	51.74	18,334,570.24	95.37	16,950,169.19	88.17
BRISTOL COUNTY	7,848,544.23	31.97	4,760,405.72	19.39	19,719,720.56	68.16	14,863,664.56	51.37
BROCKTON	26,980,621.67	135.14	23,983,607.09	120.13	20,327,852.18	78.69	23,636,603.79	91.49
BROOKLINE	17,247,954.80	90.42	14,971,829.17	78.49	20,815,577.97	72.76	19,310,168.01	67.50
CAMBRIDGE	30,569,961.18	48.53	10,652,340.42	16.91	12,325,287.21	59.60	25,937,797.26	125.43
CHELSEA	3,155,534.09	59.88	2,471,668.49	46.91	2,437,230.55	24.94	2,084,501.38	21.33
CHICOPEE	6,927,539.65	70.51	5,708,635.49	58.11	3,913,294.66	22.02	3,151,831.28	17.74
CLINTON	1,025,000.00	24.41	347,145.00	8.27	0.00	0.00	51,000.00	47.06
CONCORD	1,441,490.91	30.88	326,500.00	6.99	1,726,866.14	25.74	1,432,136.13	21.35
DANVERS	3,659,251.01	62.86	3,946,321.43	67.80	399,875.00	2.77	3,007,904.15	20.81
DEDHAM	985,123.21	8.36	60,338.13	0.51	0.00	0.00	0.00	0.00
DUKES COUNTY	1,554,157.57	54.14	538,538.04	18.76	0.00	0.00	24,823.53	1.84
EASTHAMPTON	114,871.00	12.41	93,207.87	10.07	990,031.25	18.26	415,732.08	7.67
ESSEX COUNTY	11,776,599.37	73.06	10,912,007.27	67.70	10,452,690.66	49.29	10,760,674.94	50.74
EVERETT	5,717,731.49	65.38	4,932,283.50	56.40	9,423,762.71	69.89	8,771,896.43	65.05

Table Eight

## Portfolio Turnover

Page Two

<u>Retirement System</u>	<u>Equity Turnover</u>				<u>Fixed Income Turnover</u>			
	Total Purchases	% of Market Value	Total Sales	% of Market Value	Total Purchases	% of Market Value	Total Sales	% of Market Value
FAIRHAVEN	1,200,718.76	23.41	475,349.28	9.27	0.00	0.00	0.00	0.00
FALL RIVER	12,537,077.36	68.44	8,849,019.08	48.31	35,639,012.09	84.33	29,891,897.48	70.73
FALMOUTH	496,700.00	9.17	919.97	0.02	2,191,203.14	26.69	701,167.25	8.54
FITCHBURG	1,047,037.50	16.74	541,169.41	8.65	2,372,836.95	17.90	1,480,430.07	11.17
FRAMINGHAM	27,842,442.44	79.08	3,179,408.25	9.03	7,672,414.08	N/A	26,558,659.36	N/A
FRANKLIN COUNTY	2,187,395.02	80.06	2,107,943.82	77.16	2,244,992.19	31.52	2,093,203.49	29.39
GARDNER	1,328,457.75	16.88	628,761.66	7.99	0.00	0.00	0.00	0.00
GLoucester	4,583,103.19	82.55	4,588,280.69	82.64	2,208,924.72	25.12	2,429,316.28	27.62
GREATER LAWRENCE	492,587.98	97.47	377,408.90	74.68	247,621.66	18.57	777.97	0.06
GREENFIELD	248,488.86	9.22	109,082.09	4.05	444,291.88	14.35	217,587.55	7.03
HAMPDEN COUNTY	12,787,587.50	119.34	11,073,092.96	103.34	18,424,912.56	61.99	20,690,879.38	69.62
HAMPSHIRE COUNTY	6,039,964.55	118.02	4,288,982.56	83.81	6,237,405.38	41.17	6,491,406.00	42.85
HAVERHILL	8,873,503.40	76.46	4,867,291.40	41.94	17,333,326.08	95.35	19,241,358.22	105.85
HINGHAM	10,984,894.27	98.50	2,135,874.58	19.15	198,918.00	N/A	6,840,460.30	N/A
HOLYOKE	11,687,935.51	83.87	11,627,040.29	83.43	2,633,195.31	12.58	3,961,666.11	18.93
HULL	382,400.50	119.28	531,565.98	165.81	1,654,380.00	56.09	1,356,902.15	46.00
LAWRENCE	13,061,465.56	110.15	14,370,880.57	121.19	28,894,011.61	129.94	27,164,147.87	122.16
LEOMINSTER	487,058.75	17.07	460,422.13	16.14	2,954,349.56	31.28	881,687.06	9.33
LEXINGTON	3,502,173.20	32.41	1,886,207.80	17.45	7,441,676.08	73.13	6,556,041.09	64.43
LOWELL	6,490,168.42	49.24	4,012,855.89	30.44	84,849,305.71	407.49	83,030,678.32	398.75
LYNN	20,153,343.75	76.37	19,590,531.94	74.24	13,707,093.13	45.24	9,756,380.33	32.20
MALDEN	8,150,870.78	66.03	8,826,588.93	71.50	4,672,299.83	42.80	3,520,389.66	32.25
MARBLEHEAD	3,807,107.73	64.60	4,161,248.15	70.61	3,180,381.88	52.33	2,320,774.59	38.18
MARLBOROUGH	3,512,920.66	80.21	3,452,543.42	78.83	1,929,568.95	23.84	1,842,302.43	22.76
MASS HOUSING FINA	930,135.29	8.53	0.00	0.00	0.00	0.00	0.00	0.00
MASS PORT AUTH	9,198,800.03	29.07	4,690,002.63	14.82	11,422,742.78	24.21	6,914,557.01	14.66
MASS TURNPIKE AUT	193,187.50	21.68	38,873.70	4.36	10,656,858.50	19.96	8,329,566.07	15.60

Table Eight

## Portfolio Turnover

Page Three

<u>Retirement System</u>	<u>Equity Turnover</u>				<u>Fixed Income Turnover</u>			
	Total Purchases	% of Market Value	Total Sales	% of Market Value	Total Purchases	% of Market Value	Total Sales	% of Market Value
MASS WATER RESOUR	3,799,728.27	147.70	2,806,989.75	109.11	5,139,372.79	140.60	4,638,265.73	126.89
MAYNARD	1,000,000.00	36.39	149,621.36	5.44	0.00	0.00	109,247.77	41.16
MEDFORD	3,893,202.80	59.36	1,334,379.12	20.35	5,013,305.64	25.85	4,179,715.80	21.55
MELROSE	1,839,684.69	43.79	974,874.71	23.20	2,894,390.65	35.44	3,046,772.10	37.31
METHUEN	2,007,967.25	28.33	107,993.86	1.52	4,697,633.76	55.57	4,162,565.99	49.24
MIDDLESEX COUNTY	57,340,655.00	75.47	28,185,128.39	37.10	78,215,328.97	91.14	74,962,552.27	87.35
MILFORD	2,368,294.09	52.65	1,748,680.15	38.88	3,810,460.48	68.55	3,411,871.14	61.38
MILTON	1,942,630.93	12.69	1,036,164.71	6.77	0.00	0.00	0.00	0.00
MINUTEMAN REG VO	105,822.64	5.39	0.00	0.00	0.00	0.00	0.00	0.00
MONTAGUE	617,529.78	18.92	321,884.94	9.86	0.00	0.00	0.00	0.00
NATICK	1,677,065.00	18.19	1,097,871.54	11.91	1,970,625.00	21.20	3,488,312.50	37.53
NEEDHAM	4,572,309.99	16.22	1,514,660.78	5.37	0.00	0.00	0.00	0.00
NEW BEDFORD	12,105,170.46	46.48	11,211,132.97	43.05	19,330,929.11	146.71	17,840,348.00	135.39
NEWBURYPORT	1,263,794.50	58.02	953,223.28	43.76	0.00	0.00	629,687.47	13.67
NEWTON	63,776,637.91	145.23	47,944,260.84	109.18	24,450,607.59	77.76	41,500,546.40	131.98
NORFOLK COUNTY	14,853,660.65	13.85	5,498,316.24	5.13	0.00	0.00	0.00	0.00
NORTH ADAMS	2,226,460.53	69.43	2,193,149.30	68.39	1,590,641.76	31.57	962,490.98	19.11
NORTH ATTLEBORO	1,988,759.96	70.33	1,950,835.39	68.98	4,216,906.40	65.09	4,468,245.90	68.97
NORTHAMPTON	3,385,324.86	72.21	3,365,105.83	71.78	3,230,754.51	54.94	1,812,748.67	30.83
NORTHBRIDGE	822,926.06	24.40	296,453.86	8.79	0.00	0.00	0.00	0.00
NORWOOD	105,765.88	2.90	2,060,711.84	56.58	16,838,128.79	70.08	8,613,682.65	35.85
PEABODY	10,116,578.00	84.48	9,085,273.69	75.87	4,631,429.63	27.62	4,813,767.53	28.71
PITTSFIELD	7,793,129.46	84.80	7,875,253.84	85.69	4,548,137.84	31.77	4,377,513.40	30.58
PLYMOUTH	4,729,365.63	55.73	0.00	0.00	798,500.02	6.34	1,796,127.79	14.26
PLYMOUTH COUNTY	2,842,551.97	28.83	2,638,015.40	26.76	16,053,693.93	17.74	4,456,261.88	4.92
PRIM BOARD	841,775,678.29	46.14	645,920,225.20	35.40	975,738,449.44	111.86	976,648,847.83	111.97
QUINCY	10,460,180.66	38.29	5,409,841.66	19.80	41,180,913.56	120.38	36,893,782.37	107.85

Table Eight

## Portfolio Turnover

Page Four

<u>Retirement System</u>	<u>Equity Turnover</u>				<u>Fixed Income Turnover</u>			
	Total Purchases	% of Market Value	Total Sales	% of Market Value	Total Purchases	% of Market Value	Total Sales	% of Market Value
READING	2,726,588.60	18.70	1,226,843.77	8.42	0.00	0.00	0.00	0.00
REVERE	1,624,518.50	78.35	2,152,100.16	103.80	9,191,803.05	68.23	3,413,755.57	25.34
SALEM	4,930,560.95	64.02	5,070,276.58	65.83	8,913,253.89	54.46	9,052,428.23	55.31
SAUGUS	2,236,200.05	23.97	1,483,682.13	15.90	0.00	0.00	0.00	0.00
SHREWSBURY	2,174,278.68	17.58	793,369.23	6.41	0.00	0.00	0.00	0.00
SOMERVILLE	4,921,562.66	17.54	2,830,706.66	10.09	0.00	0.00	1,215,141.04	32.16
SOUTHBRIDGE	2,011,903.42	151.86	864,333.95	65.24	1,611,997.06	79.75	1,671,066.47	82.68
SPRINGFIELD	19,547,723.84	53.96	16,654,096.54	45.97	34,191,393.57	54.74	31,184,169.84	49.92
STATE	917,457,116.98	24.75	730,835,996.84	19.71	0.00	0.00	0.00	0.00
STATE TEACHERS	719,840,494.43	18.71	175,174,238.65	4.55	0.00	0.00	0.00	0.00
STONEHAM	328,181.70	7.53	104,436.68	2.39	4,600,389.11	56.22	4,547,448.32	55.57
SWAMPSCOTT	2,126,376.42	72.73	2,641,182.62	90.34	1,691,426.68	43.07	1,061,522.20	27.03
TAUNTON	6,373,429.45	68.90	4,358,328.88	47.11	7,527,158.34	38.35	5,105,049.19	26.01
WAKEFIELD	2,544,895.07	15.39	1,426,067.19	8.62	0.00	0.00	0.00	0.00
WALTHAM	7,584,913.19	39.96	5,949,850.87	31.35	16,020,332.50	57.10	10,844,685.34	38.65
WATERTOWN	13,176,813.50	198.09	13,118,593.78	197.21	13,141,048.94	89.88	11,875,193.49	81.22
WEBSTER	1,404,025.11	71.63	236,910.05	12.09	0.00	0.00	228,281.04	38.11
WELLESLEY	18,055,072.54	109.15	17,476,920.61	105.65	22,549,590.10	117.84	21,510,528.01	112.41
WEST SPRINGFIELD	1,484,370.00	47.92	1,097,668.73	35.44	4,055,213.36	45.22	2,773,740.68	30.93
WESTFIELD	6,015,062.60	84.28	5,727,357.89	80.25	5,710,406.88	59.42	6,935,520.31	72.17
WEYMOUTH	5,530,395.53	22.30	2,380,781.62	9.60	0.00	0.00	0.00	0.00
WINCHESTER	6,351,099.00	103.13	6,192,675.16	100.56	1,782,655.41	20.56	1,313,236.56	15.15
WINTHROP	0.00	0.00	0.00	0.00	1,844,859.14	37.26	1,412,658.40	28.53
WOBURN	242,544.60	11.88	135,033.31	6.61	4,289,957.28	32.91	4,306,825.57	33.04
WORCESTER	11,545,078.71	18.11	1,532,434.69	2.40	4,494,031.32	10.36	8,133,581.20	18.74
WORCESTER COUNTY	1,440,261.54	10.48	0.00	0.00	19,391,139.93	23.50	8,456,722.23	10.25

**PART V:**

***INVESTMENT COUNSELORS, CONSULTANTS AND CUSTODIAN BANKS***

The statute governing the investment of public pension funds enables Boards to delegate day to day management responsibilities to professional investment managers. That delegation may take place only with authorization by PERA. This Division assesses the record and qualifications of the prospective manager and the Board in an objective manner and does not substitute its judgment for that of the Board.

Each manager must be a registered Investment Adviser pursuant to federal law. PERA, by regulation, also requires advisers to meet a Code of Ethics for Fiduciaries and Standards of Conduct for Investment Advisers.

In order to satisfy their fiduciary obligations, Boards must employ a process in selecting vendors which is similar to that which a prudent person would employ. Furthermore, following selection that duty requires Boards to formally monitor the manager's performance and take corrective action if necessary. Failure to follow this course of action could lead to a breach of fiduciary duty and personal liability for Board members.

Boards have recently retained investment consultants to assist in the selection and evaluation of money managers. Some firms also advise the Boards in establishing investment objectives and determining asset allocation. The Boards also have a fiduciary duty to use an objective, competitive process in the selection and retention of these vendors. Once again, failure to fulfill that duty may subject Board members to personal liability.

Custodian banks are hired by Boards for the important task of recordkeeping and holding the actual certificates of ownership in various investment instruments. These banks also play a role in the management of system cash. Once again, failure to meet fiduciary duty in the selection and retention of these banks could result in personal liability for Board members.

The chart that follows lists these firms which provide management, consulting and custodian services to the Boards. This information was taken from the records on file at PERA.

During the course of the last several years, the selection and evaluation of service providers has had an increasing impact on the investment performance of the retirement systems. Prudent decision-making in this important area will not only enable Board members to avoid personal liability but will assure solid long term performance.

The following is a list of each retirement system and the investment counselor, consultant and custodian retained by each retirement system as of August 1, 1991.

**ADAMS RETIREMENT SYSTEM**  
E.R. Taylor Investments (5/25/89)

*Custodian:* BayBank

**AMESBURY RETIREMENT SYSTEM**  
Boston Advisory Group (4/17/85-formerly Richard H. Morse)

*Consultant:* J.A. Hannah Investment Advisory Service  
*Custodian:* State Street Bank

**ANDOVER RETIREMENT SYSTEM**  
Hawthorne Associates (8/31/89)

*Custodian:* State Street Bank

**ARLINGTON RETIREMENT SYSTEM**  
Constitution Capital Management (3/5/85)

*Consultant:* Wilshire Associates  
*Custodian:* State Street Bank

**ATHOL RETIREMENT SYSTEM**  
Shawmut/Worcester County (6/25/85)  
PaineWebber Properties III (12/22/88-real estate)  
PaineWebber Independent Fund (8/8/89-real estate)

*Custodian:* Shawmut/Worcester County

**ATTLEBORO RETIREMENT SYSTEM**  
BayBanks, Inc. (4/1/85)  
PaineWebber Properties II (12/22/88-real estate)  
PaineWebber Properties II (8/28/89-real estate)

*Custodian:* BayBank

**BARNSTABLE COUNTY RETIREMENT SYSTEM**  
Aetna Capital Management (7/27/89)  
Aetna Capital Management (7/27/89-real estate)  
Aetna Capital Management (7/27/89-international equity)  
Boston Company (7/27/89-waiver revoked 10/30/90)  
Lombard Odier (12/21/89-international equity-waiver revoked 1/29/91)

*Custodian:* Multibank (South Shore Bank)

**BELMONT RETIREMENT SYSTEM**

de Burlo Group (3/26/85-waiver revoked 5/31/89)

Oppenheimer Capital (6/30/89)

The Belmont Retirement System purchased shares of the PRIT fund on 5/24/89.

*Consultant:* New England Pension Consultants

*Custodian:* BayBank

**BERKSHIRE COUNTY RETIREMENT SYSTEM**

The Berkshire County Retirement System invests pursuant to statutory restrictions on investments in accordance with M.G.L. c. 32. The Berkshire County Retirement System purchased shares of the PRIT fund on 2/23/87.

**BEVERLY RETIREMENT SYSTEM**

Aetna Capital Management (8/31/89)

Aetna Capital Management (8/31/89-real estate)

Aetna Capital Management (8/31/89-international equity)

Massachusetts Financial Services (8/31/89)

*Custodian:* State Street Bank

**BLUE HILLS REGIONAL VOCATIONAL SCHOOL EMPLOYEES RETIREMENT SYSTEM**

David L. Babson (4/12/85)

*Custodian:* Multibank (South Shore Bank)

**BOSTON RETIREMENT SYSTEM**

Wellington Management Company (2/21/85)

Capitol Bank (2/21/85-waiver revoked 12/7/88)

Eagle Asset Management (11/14/86)

Boston Company (11/14/86-international equity-waiver revoked)

Avatar Associates (11/14/86)

Bear Stearns, Inc. (2/4/87)

Oechsle International Advisors (6/30/87-international equity)

Warburg Investment Management International Ltd. (7/15/87- international equity)

State Street Bank & Trust (12/12/88)

Constitution Capital Management (12/12/88-waiver revoked)

Back Bay Advisors (9/7/89-fixed income)

Loomis Sayles & Company (9/7/89-fixed income-waiver revoked)

Massachusetts Financial Services (9/7/89-fixed income)

Richmond Capital Management (9/7/89-fixed income)

Siebel Capital Management (9/7/89-waiver revoked)

Metric Institutional Realty (9/7/89-real estate)

Criterion Investment Management (9/14/89-fixed income)

## **BOSTON RETIREMENT SYSTEM (cont'd)**

Heitman Advisory Corporation (11/17/89-real estate)  
JMB Institutional Realty (11/17/89-real estate-waiver revoked 2/14/91)  
Schroder Real Estate Capital (11/17/89-real estate-waiver revoked 2/14/91)  
MIG Realty Advisors (12/19/89-real estate)  
Shurgard Securities Corporation (5/11/90-real estate)  
Acadian Asset Management (5/11/90-international equity)  
Hill Samuel Investment Advisors, Ltd. (5/11/90-international equity-waiver revoked)  
Dimensional Fund Advisors (5/11/90-international equity)  
PCM International (5/11/90-international fixed income)  
Thomas H. Lee Equity Partners, L.P. (5/11/90-leveraged buyout)  
BEA Associates, Inc. (4/25/91-international equity)

*Supplementary regulations were approved for the following:*

Property Capital Advisors-real estate  
LaSalle Advisors I & II-real estate  
Lomas & Nettleton Company-real estate  
Frank Russell Trust-real estate  
Public Storage Inst.-real estate  
Copley Partners I & II-venture capital

*Consultant:* SEI

*Custodian:* State Street Bank

## **BRAINTREE RETIREMENT SYSTEM**

Shawmut Bank of Boston (4/1/85-changed to 1838 Investment Advisors on 9/9/86)  
1838 Investment Advisors (9/9/86)

*Custodian:* BayBank

## **BRISTOL COUNTY RETIREMENT SYSTEM**

de Burlo Group (3/25/85-waiver revoked 9/1/88)  
BayBanks, Inc. (3/16/88-fixed income)  
Aetna Capital Management (2/23/89)  
Aetna Capital Management (2/23/89-real estate)  
Aetna Capital Management (2/23/89-international equity)  
BayBanks, Inc. (7/05/89-equity)

*A supplementary regulation was approved for the following:*

Palmer Organization III L.P.-venture capital

*Custodian:* BayBank

## **BROCKTON RETIREMENT SYSTEM**

Fort Hill (3/22/85-waiver revoked 2/23/90)  
Freedom Capital Management Corporation (6/7/89)  
Marathon Investment Management (6/7/89-equity-waiver revoked 5/30/91)  
Loomis Sayles & Company (6/7/89-fixed income)  
Keystone Investment Management Corporation (3-1-90)  
Lehndorff Babson (5-11-90-real estate)  
Bank of Ireland (6-15-90-international equity)

*Consultant:* Prime (Kidder Peabody)

*Custodian:* Boston Safe Deposit

## **BROOKLINE RETIREMENT SYSTEM**

State Street Research (6/26/86)  
State Street Research (8/24/89-international)  
The Brookline Retirement System purchased shares of the PRIT fund on 9/30/89.

*Consultant:* New England Pension Consultants

*Custodian:* State Street Bank

## **CAMBRIDGE RETIREMENT SYSTEM**

APT Financial Services (5/19/88-real estate)  
(APT Income Plus I L.P.)  
Acorn Asset Management Corporation (11/9/90)  
Freedom Capital Corporation (11/9/90)  
State Street Research & Management Company (11/9/90)  
Wellington Management Company (11/9/90)  
Mutual of NY (11/9/90-fixed income)  
(Intermediate Bond Fund & Public Bond Fund Pooled Account)  
Aetna Capital Management, Inc. (11/9/90)  
Aetna Congregate Care Fund (11/9/90-real estate)  
Bank of Ireland (11/9/90-international equity)

*Consultant:* Prime (Kidder Peabody)

*Custodian:* State Street Bank

## **CHELSEA RETIREMENT SYSTEM**

Keystone Investment Management Corporation (3/4/87-waiver revoked 4/1/88)  
BayBanks, Inc. (8/24/89)

*Custodian:* BayBank

## **CHICOPEE RETIREMENT SYSTEM**

Freedom Capital Management Corporation (6/26/86)  
Leonard Management Group (3/21/88)  
Federal Street Financial Advisors (11/24/89)

*Custodian:* BayBank

### **CLINTON RETIREMENT SYSTEM**

The Clinton Retirement System identified Alex Brown as investment counselor for the calendar year 1986. The Clinton Retirement System identified Aetna Capital Management as investment counselor for the calendar year 1989.

Aetna Capital Management (2/14/91)

Aetna Capital Management (2/14/91-real estate)

Aetna Capital Management (2/14/91-international equity)

### **CONCORD RETIREMENT SYSTEM**

Constitution Capital Management (5/21/86)

Frank Russell Trust Company (5/21/86)

The Concord Retirement System purchased shares of the PRIT fund.

*Custodian:* Bank of New England

### **DANVERS RETIREMENT SYSTEM**

Boston Advisory Group (4/3/85-formerly Richard H. Morse)

The Danvers Retirement System purchased shares of the PRIT fund on 8/18/87.

*Custodian:* State Street Bank

### **DEDHAM RETIREMENT SYSTEM**

The Dedham Retirement System identified Aetna Capital Management as investment counselor for the calendar years ending 1986 and 1987. The Dedham Retirement System transferred to the PRIT fund on 6/30/88.

### **DUKES COUNTY RETIREMENT SYSTEM**

Aetna Capital Management (3/7/91)

Aetna Capital Management (3/7/91-real estate)

Aetna Capital Management (3/7/91-international equity)

### **EASTHAMPTON RETIREMENT SYSTEM**

Heritage Bank for Savings & Wright Investors Service (4/12/85-

(Northampton Institution for Savings changed its name to Heritage Bank for Savings on 6/13/90)

*Custodian:* Investors Bank and Trust

### **ESSEX COUNTY RETIREMENT SYSTEM**

Freedom Capital Management Corporation (5/6/85)

Federal Street Financial Advisors (1/4/90)

*Custodian:* BayBank

**EVERETT RETIREMENT SYSTEM**  
**BayBanks, Inc. (2/15/85)**

*Custodian:* BayBank

**FAIRHAVEN RETIREMENT SYSTEM**  
The Fairhaven Retirement System transferred to the PRIT fund on 7/1/86.

**FALL RIVER RETIREMENT SYSTEM**  
BayBanks, Inc. (8/27/85)

*Custodian:* BayBank

**FALMOUTH RETIREMENT SYSTEM**  
State Street Bank (4/3/85)

*Custodian:* State Street Bank

**FITCHBURG RETIREMENT SYSTEM**  
Safety Fund National Bank (4/19/85-name change from First Safety Fund National Bank)

*Custodian:* Safety Fund National Bank

**FRAMINGHAM RETIREMENT SYSTEM**  
State Street Research for Met. Life (10/17/90-South Africa Free Equity Fund)  
State Street Research for Met. Life (10/17/90-Bond Fund)  
The Framingham Retirement System purchased shares of the PRIT fund on 11/28/86.

**FRANKLIN COUNTY RETIREMENT SYSTEM**  
de Burlo Group (12/2/85-waiver revoked 1/19/88)  
Freedom Capital Corporation (3/31/88)

*Custodian:* State Street Bank

**GARDNER RETIREMENT SYSTEM**  
Shawmut Bank of Boston (5/21/85-transferred to PRIT fund)  
The Gardner Retirement System transferred to the PRIT fund on 12/1/86.

**GLOUCESTER RETIREMENT SYSTEM**  
Freedom Capital Management Corporation (4/19/85)

*Custodian:* Multibank (South Shore Bank)

## **GREATER LAWRENCE SANITARY DISTRICT AUTHORITY RETIREMENT SYSTEM**

Shawmut/Arlington Trust Co. (7/29/86-waiver revoked 5/23/90)  
Beacon Capital Management Inc. (5/23/90-ownership change to Beacon Capital Management Inc. from University Bank and Trust on 12/31/90)

*Custodian:* University Bank and Trust

## **GREENFIELD RETIREMENT SYSTEM**

Bank of New England-West (7/29/86)  
PaineWebber Properties III (4/17/89-real estate)  
Harbor Capital Management Company, Inc. (3/14/91)  
The Greenfield Retirement System purchased shares of the PRIT fund on 2/25/87.

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* Bank of New England-West

## **HAMPDEN COUNTY RETIREMENT SYSTEM**

Rollert & Sullivan (4/11/85-waiver revoked 7/31/85)  
Boston Company (8/16/85-waiver revoked 10/1/90)  
Freedom Capital Management Corporation (10/13/88)  
Wellington Management Company (5/8/91)

*Consultant:* PaineWebber

*Custodian:* BayBank

## **HAMPSHIRE COUNTY RETIREMENT SYSTEM**

Bank of New England-West (4/11/85-changed to Constitution Capital Management 10/26/89)  
Constitution Capital Management (10/26/89)  
Bank of Ireland Asset Management (12/12/90-international equity)  
Leshner Financial Services, Inc. (12-12-90-equity)  
Lehndorff & Babson Property Fund IV (1-29-91)

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* State Street Bank

## **HAVERHILL RETIREMENT SYSTEM**

Boston Company (7/8/85)  
Lehndorff & Babson Property Fund III (10/27/88-real estate)  
Babson-Stewart Ivory (8/17/89-international equity)  
E.R. Taylor Investments, Inc. (1/15/91-equity)  
Phoenix Investment Counsel, Inc. (1/15/91-equity)

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* BayBank

## **HINGHAM RETIREMENT SYSTEM**

Constitution Capital Management (12/11/86-purchased shares of the PRIT fund on 5/1/86 prior to transferring in on July 1, 1990)  
The Hingham Retirement System transferred to the PRIT fund on 7/1/90.

## **HOLYOKE RETIREMENT SYSTEM**

David L. Babson Company (12/6/85-waiver revoked 3/1/90)  
Freedom Capital Management Corporation (12/6/85)  
Internal-Ray Depelteau (12/6/85-waiver revoked 1/31/88)  
Leonard Management Group (8/20/86-waiver revoked 3/1/90)  
Clemente Capital, Inc. (3-1-90-Freedom Global Fund and Freedom Environmental Fund)

*Custodian:* Bank of Boston

## **HULL RETIREMENT SYSTEM**

Fort Hill Investors (7/8/85-waiver revoked 8/1/90)  
Scimitar North American Asset Management, Inc. (10/16/90)

*Custodian:* State Street Bank

## **LAWRENCE RETIREMENT SYSTEM**

National Investment Services of America, Inc. (1/24/86)

*Custodian:* BayBank

## **LEOMINSTER RETIREMENT SYSTEM**

Safety Fund National Bank (4/1/85-name change from First Safety Fund National Bank)

*Custodian:* Safety Fund National Bank

## **LEXINGTON RETIREMENT SYSTEM**

Wellington Management Company (1/25/89)  
Wellington Management Company (pending regulatory approval- international)

*Custodian:* BayBank

## **LOWELL RETIREMENT SYSTEM**

BayBank Middlesex (6/6/85-waiver revoked 11/13/85)  
Shurgard Realty Advisors (4/6/89-real estate)  
Constitution Capital Management (9/14/89-equity)  
J.L. Kaplan Associates (9/14/89-equity)  
Consistent Asset Management (9/14/89-fixed income)  
One Federal Asset Management (9/14/89-fixed income)  
Metric Institutional Realty (2/8/90-real estate)  
Charles River Partnership VI-A (5/2/91-venture capital)

**LOWELL RETIREMENT SYSTEM (cont'd)**

United States Trust Asset Management (5/22/91-equity)

The Lowell Retirement System purchased shares of the PRIT fund on 7/10/87.

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* BayBank

**LYNN RETIREMENT SYSTEM**

de Burlo Group (3/26/85)

*A supplementary regulation was approved for the following:*

Palmer Organization III L.P.-venture capital

*Custodian:* BayBank

**MALDEN RETIREMENT SYSTEM**

de Burlo Group (3/27/85)

*Custodian:* State Street Bank

**MARBLEHEAD RETIREMENT SYSTEM**

de Burlo Group (4/3/85)

*Custodian:* BayBank

**MARLBOROUGH RETIREMENT SYSTEM**

Freedom Capital Management Corporation (6/23/88)

*Custodian:* BayBank

**MASSACHUSETTS HOUSING FINANCE AGENCY RETIREMENT SYSTEM**

The Massachusetts Housing Finance Agency Retirement System transferred to the PRIT fund on 6/1/87. The Massachusetts Housing Finance Agency Retirement System purchased shares of the PRIT fund on 1/16/87 prior to transferring in.

**MASSACHUSETTS PORT AUTHORITY RETIREMENT SYSTEM**

Wellington Management Company (2/7/85)

Wellington Management Company (11/24/89-international)

*A supplementary regulation was approved for the following:*

Copley Partners I & II-venture capital

*Custodian:* Shawmut Bank

**MASSACHUSETTS TURNPIKE AUTHORITY RETIREMENT SYSTEM**

The Massachusetts Turnpike Authority Retirement System identified S.J. Britton Investment Counsel as investment counselor for the calendar year ending 1989.  
S.J. Britton Investment Counsel (pending regulatory approval)

*Custodian:* Shawmut Bank

**MASSACHUSETTS WATER RESOURCES AUTHORITY RETIREMENT SYSTEM**

Boston Company (2/11/88)

The Massachusetts Water Resources Authority Retirement System purchased shares of the PRIT fund on 2/1/88.

*Custodian:* Bank of New England

**MAYNARD RETIREMENT SYSTEM**

The Maynard Retirement System invests pursuant to statutory restrictions on investments in accordance with M.G.L. c. 32. The Maynard Retirement System identified Alex Brown & Sons as investment counselor for the calendar years ending 1988 and 1989. The Maynard Retirement System identified Aetna Capital Management as investment counselor for the calendar year ending 1990.

**MEDFORD RETIREMENT SYSTEM**

Constitution Capital Management (3/14/85)

Lehndorff & Babson (3/12/90-real estate)

Shurgard Realty Advisors II (3/12/90-real estate)

Connecticut Investment Management, Inc. (pending regulatory approval-equity)

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* Bank of New England

**MELROSE RETIREMENT SYSTEM**

Constitution Capital Management (4/3/85)

Lehndorff & Babson (7/27/89-real estate)

*Custodian:* Bank of New England

**METHUEN RETIREMENT SYSTEM**

David L. Babson (10/16/86)

The Methuen Retirement System purchased shares of the PRIT fund on 4/1/88.

*Custodian:* Bank of New England

## **MIDDLESEX COUNTY RETIREMENT SYSTEM**

Constitution Capital Management (3/26/85)  
Boston Company (3/6/86-waiver revoked)  
Putnam Advisory Company (3/6/86-waiver revoked 9/1/89)  
Oppenheimer Capital (8/25/87)  
Siebel Capital Management (9/28/89-fixed income-waiver revoked)  
Income Research & Management (9/28/89-fixed income)  
Gardner & Preston Moss, Inc. (9/28/89-fixed income)  
Aldrich, Eastman & Waltch (2/1/90-real estate-waiver revoked 5/30/91)  
Lehndorff & Babson (2/1/90-real estate)  
Metric Institutional Realty (2/1/90-real estate)  
Metropolitan Life (2/1/90-real estate)  
Mid-Atlantic Realty Advisors (2/1/90-real estate)  
Shurgard Realty Advisors (2/1/90-real estate)  
Trammel Crow (2/1/90-real estate-waiver revoked 4/5/90)  
MFS Small Cap Growth (5/11/90)  
Bank of Ireland Asset Management (1/10/91-international equity)  
Equitable Capital Management Corporation (1/10/91-equity)  
Hawthorne Associates, Inc. (1/10/91-equity)  
Commonwealth BioVentures III L.P. (3/27/91-venture capital)  
Charles River Partnership VI-A (4/10/91-venture capital)  
BayBanks, Inc. (5/30/91-fixed income)

*A supplementary regulation was approved for the following:*

**APT Financial Services (APT Income Plus I L.P.)-real estate**

*Consultant: J.A. Hannah Investment Advisory Service*

*Custodian: BayBank*

## **MILFORD RETIREMENT SYSTEM**

**BayBank Middlesex (1/18/89)**

*Custodian: BayBank*

## **MILTON RETIREMENT SYSTEM**

The Milton Retirement System transferred to the PRIT fund on 7/1/86.

## **MINUTEMAN REGIONAL VOCATIONAL TECHNICAL SCHOOL DISTRICT RETIREMENT SYSTEM**

The Minuteman Retirement System transferred to the PRIT fund on 7/1/85.

## **MONTAGUE RETIREMENT SYSTEM**

Gardner & Preston Moss, Inc. (3/5/86-transferred to the PRIT fund)  
The Montague Retirement System transferred to the PRIT fund on 7/1/86.

**NATICK RETIREMENT SYSTEM**  
United Investment Counsel (3/14/85)

*Custodian:* BayBank

**NEEDHAM RETIREMENT SYSTEM**  
Fort Hill (3/12/85-transferred to the PRIT fund)  
The Needham Retirement System transferred to the PRIT fund on 7/1/85.

**NEW BEDFORD RETIREMENT SYSTEM**  
Shawmut/Bristol County (8/2/85-waiver revoked 10/9/86)  
Massachusetts Financial Services (6/15/89)  
Aetna Capital Management (6/15/89)  
Aetna Capital Management (6/15/89-real estate)  
Aetna Capital Management (6/15/89-international equity)  
Lombard Odier (9/28/89-international equity)

*Custodian:* BayBank

**NEWBURYPORT RETIREMENT SYSTEM**  
Boston Advisory Group (3/28/85-formerly Richard H. Morse)

*Custodian:* State Street Bank

**NEWTON RETIREMENT SYSTEM**  
Standish, Ayer & Wood (3/4/85-management change 1/30/87)  
Boston Company (3/19/87)  
1838 Investment Advisors (3/19/87)  
Loomis, Sayles & Company (3/19/87-waiver revoked 5/23/90)  
Freedom Capital Corporation (3/19/87)  
Hellman, Jordan Management Company (5/23/90)  
Bankers Trust Investment Management Ltd. (5/23/90-international equity)

*Consultant:* Prime (Kidder Peabody)

*Custodian:* Boston Safe Deposit

**NORFOLK COUNTY RETIREMENT SYSTEM**  
The Norfolk County Retirement System transferred to the PRIT fund on 11/1/85.

**NORTH ADAMS RETIREMENT SYSTEM**  
de Burlo Group (3/25/85)

*Custodian:* Bank of New England

## **NORTH ATTLEBORO RETIREMENT SYSTEM**

Keystone Investment Management Corporation (2/10/87-waiver revoked)  
PaineWebber Properties III (10/27/88-real estate)  
PaineWebber Properties II (6/22/89-real estate)  
PaineWebber Independent Fund (7/13/89-real estate)  
Connecticut National Bank (12/26/90-equity)  
Oxford Capital Management, Inc. (4/9/91)

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* BayBank

## **NORTHAMPTON RETIREMENT SYSTEM**

de Burlo Group (4/18/85)

*Custodian:* BayBank

## **NORTHBRIDGE RETIREMENT SYSTEM**

Shawmut/Worcester County (4/4/85-transferred to the PRIT fund)  
The Northbridge Retirement System transferred to the PRIT fund on 1/1/88.

## **NORWOOD RETIREMENT SYSTEM**

Constitution Capital Management (3/5/85)  
Dean Witter Dividend Growth Securities, Inc. (11/2/89)  
Manufacturers Life Insurance Equity Fund (11/2/89)  
Dean Witter Realty Yield Plus L.P. (11/2/89-real estate)  
MFS Lifetime Capital Growth Trust (11/17/89)  
The Norwood Retirement System purchased shares of the PRIT fund on 8/13/87.

*Custodian:* Bank of New England

## **PEABODY RETIREMENT SYSTEM**

Freedom Capital Management Corporation (7/8/85)  
Clemente Capital, Inc. (3/22/90-Freedom Global Fund and Freedom Environmental Fund)

*Custodian:* BayBank

## **PITTSFIELD RETIREMENT SYSTEM**

de Burlo Group (12/11/86-waiver revoked 5/25/89)  
Internal-Lawrence Grizey (12/11/86-waiver revoked 1/15/88)  
Freedom Capital Corporation (6/15/89)

*Custodian:* First Agricultural Bank

## **PLYMOUTH RETIREMENT SYSTEM**

State Street Bank (2/24/89)

*Custodian:* State Street Bank

### **PLYMOUTH COUNTY RETIREMENT SYSTEM**

Internal-John McLellan (5/14/85-partial removal of statutory restrictions)

Babson-Stewart Ivory (5/4/89-international equity)

Lehndorff & Babson III (5/4/89-real estate)

Shurgard Realty Advisors (Shurgard Institutional Fund L.P.)

(5/4/89-real estate)

Metric Institutional Realty (Metric Institutional Apartment Fund, L.P.)

(10/5/89-real estate)

Charles River Partnership VI-A (3/26/91-venture capital)

Commonwealth BioVentures III L.P. (4/10/91-venture capital)

American Network Group Institutional Fund I, L.P. (4/11/91- venture capital)

JCW Ventures (Capital Fund Partners IV) (5/30/91-venture capital)

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* State Street Bank

### **QUINCY RETIREMENT SYSTEM**

South Shore Bank (5/22/85-waiver revoked 1/9/89)

Mass Financial Services (2/9/89)

M.D. Sass Investors Company (2/9/89)

The Quincy Retirement System purchased shares of the PRIT fund on 3/1/90.

*Custodian:* State Street Bank

### **READING RETIREMENT SYSTEM**

de Burlo Group (6/3/85-transferred to the PRIT fund)

The Reading Retirement System transferred to the PRIT fund on 6/1/88.

### **REVERE RETIREMENT SYSTEM**

Fort Hill (3/27/87-partial removal of statutory restrictions from 5/14/85 through 3/27/87-waiver revoked 7/25/90)

Scimitar North American Asset Management, Inc. (8/8/90)

Nutter Investment Advisors (pending regulatory approval-equity)

*Consultant:* Faneuil Hall Securities, Inc.

*Custodian:* State Street Bank

### **SALEM RETIREMENT SYSTEM**

Shawmut Bank of Boston (4/2/85-waiver revoked 4/19/90)

Freedom Capital Management Corporation (11/17/88)

PaineWebber Properties III (11/17/88-real estate)

1838 Investment Advisors (4/12/90)

*Consultant:* Shearson Lehman

*Custodian:* BayBank

**SAUGUS RETIREMENT SYSTEM**

The Saugus Retirement System transferred to the PRIT fund on 7/1/86.

**SHREWSBURY RETIREMENT SYSTEM**

BayBanks, Inc. (2/12/85-transferred to the PRIT fund)

The Shrewsbury Retirement System transferred to the PRIT fund on 7/1/85.

**SOMERVILLE RETIREMENT SYSTEM**

The Somerville Retirement System invests pursuant to statutory restrictions on investments in accordance with M.G.L. c. 32. The Somerville Retirement System identified Alex Brown as investment counselor for the calendar year ending 1986.

**SOUTHBRIDGE RETIREMENT SYSTEM**

Freedom Capital Management Corporation (11/9/89)

*Custodian:* State Street Bank

**SPRINGFIELD RETIREMENT SYSTEM**

Bank of New England-West (5/6/85-changed to BayBanks 10/13/87)  
BayBanks, Inc. (10/13/87)

*Consultant:* Wyatt Asset Services

*Custodian:* BayBank

**STATE EMPLOYEES' RETIREMENT SYSTEM**

The State Employees Retirement System is managed by the Office of the Treasurer.

**STATE TEACHERS' RETIREMENT SYSTEM**

The State Teachers Retirement System is managed by the Office of the Treasurer.

**STONEHAM RETIREMENT SYSTEM**

David L. Babson Company, Inc. (7/26/85)

Lehndorff & Babson Real Estate Counsel (Property Fund III)  
(11/17/88-real estate)

Lehndorff & Babson Real Estate Counsel (Property Fund IV)  
(1/15/91-real estate)

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* BayBank

**SWAMPSCOTT RETIREMENT SYSTEM**

de Burlo Group (3/27/85)

## **TAUNTON RETIREMENT SYSTEM**

**U.S. Trust Company (6/25/85)**

**Lehndorff & Babson Real Estate (12/21/89-real estate)**

**Capital Research & Management (5/16/90-EuroPacific Growth Fund)**

*Consultant:* Prime (Kidder Peabody)

*Custodian:* U.S. Trust

## **WAKEFIELD RETIREMENT SYSTEM**

The Wakefield Retirement System transferred to the PRIT fund on 7/1/85.

## **WALTHAM RETIREMENT SYSTEM**

**BayBanks, Inc. (2/11/85)**

*Custodian:* BayBank

## **WATERTOWN RETIREMENT SYSTEM**

**Boston Company (3/19/85)**

**Gardner & Preston Moss, Inc. (10/5/89)**

**Lehndorff & Babson (10/5/89-real estate)**

**Wellington Management Company (3/20/91-small cap. equities)**

**Newbold's Asset Management, Inc. (pending regulatory approval-equity)**

*Consultant:* Dahab Associates, Inc.

*Custodian:* BayBank

## **WEBSTER RETIREMENT SYSTEM**

The Webster Retirement System identified Alex Brown & Sons as investment counselor for the calendar years ending 1988 and 1989.

**Aetna Capital Management (6/26/91-domestic)**

**Aetna Capital Management (6/26/91-real estate)**

**Aetna Capital Management (6/26/91-international equity)**

*Consultant:* Faneuil Hall Securities, Inc.

## **WELLESLEY RETIREMENT SYSTEM**

**Standish, Ayer & Wood (2/27/85)**

**Federal Street Financial Advisors (1/23/90)**

**Consolidated Investment Corporation (Consolidated Standish Short-Term Asset Reserve Fund) (1/2/91)**

**Standish International Fixed Income Fund (5/8/91)**

*A supplementary regulation was approved for the following:*

**Standish Small Equity Fund**

*Custodian:* Shawmut Bank

**WEST SPRINGFIELD RETIREMENT SYSTEM**

Shawmut First Bank & Trust (2/21/86)

*Custodian:* Shawmut (1st Bank)

**WESTFIELD RETIREMENT SYSTEM**

Bank of New England-West (4/4/85-waiver revoked 9/6/90)

PaineWebber Properties III (11/17/88-real estate)

PaineWebber Properties II, III (9/14/89-real estate)

Freedom Capital (10/16/90)

Federal Street Financial Advisors (10/16/90)

*Custodian:* Bank of New England (West)

**WEYMOUTH RETIREMENT SYSTEM**

The Weymouth Retirement System transferred to the PRIT fund on 10/1/84.

**WINCHESTER RETIREMENT SYSTEM**

Tucker Anthony/R.L. Day (5/6/86-waiver revoked 4/26/90)

Freedom Capital Corporation (4/26/90)

*Consultant:* Shearson Lehman

*Custodian:* BayBank

**WINTHROP RETIREMENT SYSTEM**

Constitution Capital Management (3/12/85)

*Custodian:* Bank of New England

**WOBURN RETIREMENT SYSTEM**

David L. Babson (3/21/88)

*Custodian:* BayBank

**WORCESTER RETIREMENT SYSTEM**

Trident Investment Management (5/5/86-waiver revoked 4/6/89)

Frank Russell Trust Company (5/5/86-waiver revoked 3/7/91)

Mechanics Bank (10/16/86-waiver revoked 12/19/89)

Bank of New England-Worcester (1/14/87)

Safety Fund National Bank (3/6/91)

State Street Research & Management (3/6/91)

Metropolitan Life Insurance Tower Fund (3/6/91-real estate)

Metropolitan Life Insurance (3/6/91-real estate-Closed-End II Fund)

The Worcester Retirement System purchased shares of the PRIT fund on 12/30/86.

*Consultant:* J.A. Hannah Investment Advisory Service

*Custodian:* State Street Bank

**WORCESTER COUNTY RETIREMENT SYSTEM**

Massachusetts Financial Services (pending regulatory approval- equity)  
One Federal Asset Management (pending regulatory approval-fixed income)  
Wellington Management Company (pending regulatory approval)

*Consultant:* SEI

*Custodian:* Boston Safe Deposit

The PENSION RESERVE INVESTMENT TRUST fund has retained the following investment counselors as of March 28, 1991:

*Domestic Equity:*

Alliance Capital Management Corporation  
Bear Stearns Asset Management  
Lazard Freres Asset Management  
Panagora Asset Management  
U.S. Trust Company

*Domestic Fixed Income:*

Fidelity Management Trust Company  
W.R. Huff Asset Management Company  
Lehman Ark Management Company, Inc.  
One Federal Asset Management  
Pacific Asset Management Company  
Putnam Advisory Company  
Standish, Ayer & Wood, Inc.  
TCW Asset Management Company

*International Equity:*

Acadian Asset Management, Inc.  
Baring International Investment Ltd.  
Daiwa International Capital Management Corporation  
General Electric Investment Corporation  
H.D. International Limited  
Nomura Capital Management  
Oechsle International Advisors  
Scudder, Stevens & Clark, Inc.  
State Street Bank & Trust Company

*International Fixed Income:*

Baring International Investment Ltd.  
N.M. Rothschild International Asset Management Ltd.

*Special Equity:*

Advent Management Opportunities  
Advent ESSF  
Boston Ventures III  
Forstmann Little III and IV  
INVEXCO  
KKR 1986 and 1987 Funds  
MMG Patricof  
Madison Group L.P.  
Schroder UK II  
Smith Offshore  
Thomas H. Lee Equity Partners  
TCW Asset Management Company  
Emerging Markets Growth Fund, Inc.  
Emerging Markets Management

*Venture Capital:*

Advent Network  
APA Ventures III  
APA UK IV  
APA Risque III  
APA German European Venture  
Arral Private Equity Trust II  
Commonwealth BioVenture II and III  
Davis Venture Partners  
Golder, Thoma & Cressey III  
Hancock Ventures III  
Hancock International Equity  
John Hancock Venture II  
Mayflower Fund/Hancock Ventures  
Morgan Holland Fund II  
M.T.D.C.  
Schroder Ventures III  
Southern California Venture II  
T.A. Associates  
Venture Capital of New England  
Vista III

*Real Estate:*

Aldrich, Eastman & Waltch  
INVESCO Realty Advisors  
John Hancock Apt. Fund  
Bank of Boston  
Copley Realty Advisors  
JMB Realty Corporation  
Heitman Realty Advisors  
Mass. Mutual  
T.A. Realty Advisors  
TCW Realty  
Bear Stearns Apt. Fund

*Consultant:* Wilshire Associates

*Custodian:* State Street Bank

## **PENSION INVESTMENT ADVISORY UNIT**

**LISA R. REIBSTEIN**  
Director

**ROBERT P. SHAW**  
Assistant Director

## **INVESTMENT ANALYSTS**

**VICTORIA MARCORELLE**  
**JUSTIN MALLAHAN**  
**MARY J. McNAMARA**

**ROSE CIPRIANI**  
Administrative Assistant

**DIVISION OF PUBLIC EMPLOYEE  
RETIREMENT ADMINISTRATION  
ONE ASHBURTON PLACE, ROOM 1101  
BOSTON, MA 02108  
(617) 727-9380**